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FINAL FIELD DATA REPORT

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Sediment

1974-75, 1975-76

D. Skinner
VTN Colorado, Inc.
Parker Place Four
2600 South Parker Road
Denver, Colo. 80232

APR - 1976
23rd,
VTN COLORADO

Huffman Lab. No. 92376
P.O. No. LAB-1517-A-116-A

SIX FOLD DISSOLVED ORGANIC CARBON

FRACTIONATION RESULTS

Sample	S-1	S-2	S-6	S-11
Conductivity (micromhos)	750	3900	5000	815
pH	6.3	7.5	7.4	6.8
Dissolved organic carbon (ppm C)	1.9	10.4	17.5	2.0
Hydrophobics Total (ppmC)	0.7 (37)	5.0 (48)	7.7 (44)	0.8 (40)
bases	<0.1	<0.1	<0.1	0.1 (5)
acids	0.5 (26)	3.1 (30)	5.9 (34)	0.6 (30)
neutrals	0.2 (11)	1.9 (18)	1.8 (10)	0.1 (5)
Hydrophilics Total (ppmC)	1.2 (63)	5.4 (52)	9.8 (56)	1.2 (60)
bases	0.3 (16)	0.5 (5)	1.0 (6)	0.3 (15)
acids	0.8 (42)	3.9 (37)	7.3 (42)	0.7 (35)
neutrals	0.1 (5)	1.0 (10)	1.5 (9)	0.2 (10)

The numbers in parentheses are the percent of the total DOC in that fraction.

Conductivity and pH values are those which were received with the samples.

Subject to revision

Sta# 09306400

UNITED STATES DEPARTMENT
GEOLOGICAL SURVEY -- WATER

Stream discharge, concentration and load of suspended sediment of [illegible]
for water year October 19[illegible]

Day	October			November			December		
	Mean discharge (cfs) Q	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: ~~Tons per day~~ Tons	Mean discharge (cfs) Q	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: ~~Tons per day~~ Tons	Mean discharge (cfs) Q	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: ~~Tons per day~~ Tons
1									
2									
3									
4				467	132	1500			
5							340	139	1200
6									
7									
8				450	73	1500			
9	466	116	1430				~~340~~ 290	155	
10									
11				482	116	1400			
12									
13				~~415~~ 405	74	1540			
14									
15				441	74	1230			
16									
17									
18									
19									
20									
21				439	113	1350			
22		172							
23									
24									
25									
26				428	83	1230			
27									
28	449	81	1500						
29									
30									
31									

- OF THE INTERIOR
RESOURCES DIVISION

Subject to revision

River above Hell's Hole Canyon, near Watson, Utah 09306400

September 1975

ay	January Mean discharge (cfs) GH	January Suspended Sediment Mean concentration (mg/l)	January Suspended Sediment Tons per day	February Mean discharge (cfs) GH	February Suspended Sediment Mean concentration (mg/l)	February Suspended Sediment Tons per day	March Mean discharge (cfs) GH	March Suspended Sediment Mean concentration (mg/l)	March Suspended Sediment Tons per day
1									
2									
3									
4				526 ~~4.26~~	252	1320	992 ~~4.75~~	719	1200
5									
6				730 ~~4.60~~	144	1245	465 ~~4.75~~	786	1207
7	496 ~~4.21~~	175	1500						
8									
9	Q= 419	186	1445						
10									
11				765 ~~4.70~~	504	1200		1140	
12									
13				712 ~~4.57~~	740	1320	658 ~~4.48~~	2130	1230
14	310 ~~3.84~~	101	1300						
15									
16	640 ~~4.45~~	275	1310						
17									
18				616 ~~4.41~~	404	1335	Q= 409	1110	1140
19									
20				514 ~~4.24~~	330	1120	450 ~~4.12~~	2280	1350
21	712 ~~4.57~~	224	1330						
22									
23	682 ~~4.52~~	382	1430						
24									
25				514 ~~4.24~~	306	1030	Q= 409	339	1230
26									
27				646 ~~4.46~~	706	1225	Q= 430	372	1145
28	733 ~~4.61~~	223	1245						
29									
30	712 ~~4.57~~	184	1310						
31									

subject to revision

	April			May			June		
1				540	574	1055			
2									
3	323	290	1030						
4	409	199	1050				2347	2650	1810
5									
6				129	158	1230			
7									
8				599	516	1160			
9							3727	4320	1245
10	396	332	1015					3050	1015
11									
12							2950	2170	1950
13									
14									
15									
16				1027	5950	1405			
17									
18									
19							2410	1600	1235
20									
21									
22									
23				2500	4150	1030			
24	495	358	1030						
25									
26							2553	1480	1135
27				1521	3220	1500			
28									
29				1859	3550	1100			
30									
31									
Total									

Maximum daily, tons

Minimum daily, tons

Discharge					Concentration					Load				
Copied					Copied					Computed				
Checked					Checked					Checked				
Date					Date					Date				

United States Department of the Interior
Geological Survey--Water Resources Division

Unpublished Records
Subject to Revision

Periodic determinations of suspended-sediment discharge

09306430 EVACUATION CREEK NEAR MOUTH

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment		
				Mean concentration (mg/l)	Discharge (tons per day)	
10/10/74	1500		0.02	66		
10/14/74				280		
11/12/74	1500		0.05	224		
11/14/74	1115		0.11	23		
11/15/74	1540		0.14	60		
11/25/74	1550		0.03	24		
12/5/74	1500		CH ~~2.00~~ 0.34	31		EIR
12/16/74	1240		0.04	153		
1/21/75	1210		CH ~~2.00~~ 0.34	95		
1/27/75	1030		0.03	20		
2/12/75	1505		0.15	47		
2/4/75	1400		CH ~~1.95~~ 0.31	67.5		
2/20/75	1245		0.03	69		
2/27/75	1350		0.04	65		
3/3/75	1245		12.2	10,285		
3/4/75	1325		0.74	1,210		
3/4/75	1610		10.96	10,500		
3/4/75	1700		10.3	6965		EIR
3/6/75	1200		1.59	1035		
3/11/75	1125		0.67	1553		
3/17/75	1140		0.33	5.5		

Unpublished Records

United States Department of the Interior

Geological Survey--Water Resources Division

Subject to Revision

Periodic determinations of suspended-sediment discharge

09306415 Evacuation Creek Below Pipe Canyon

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment		
				Mean concentration (mg/l)	Discharge (tons per day)	
11/8/74	1330		0.29	34		
11/11/74	1405		0.16	10		
11/13/74	1145		0.31	41		
11/15/74	1445		0.26	39		
11/14/74	1700		GH = 4.01	47		ETR
11/19/74	1440		0.13	7		
11/21/74	1235		0.24	36		
11/26/74	1115		0.34	89		
12/9/74	1550		0.19	93		
12/17/74	1430		GH = ~~2.60~~ 1.1	33		
12/4/74	1600		0.17	8		ETR
1/5/75	1330		GH = ~~4.09~~	279		ETR
1/30/75	1340		GH = ~~4.55~~ 0.18	61		
2/4/75	1335		GH = ~~4.50~~ 0.20	139		
2/12/75	1410		0.56	37		
2/20/75	1055		Frozen	52		
2/27/75	1145		0.09	54		
3/5/75	1245		3.02	3465		ETR
3/4/75	1412		3.41	4155		
3/13/75	1240		0.24	115		
3/17/75	1513		0.29	154		

United States Department of the Interior
Geological Survey--Water Resources Division

Publication Records
Subject to Revision

Periodic determinations of suspended-sediment discharge

09361415

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment: Mean concentration (mg/l)	Suspended sediment: Discharge (tons per day)	
3/21/75	1100		0.27	8		
3/24/75	1105		0.2	262		
3/26/75	1400		3.14	23100		
4/4/75	1130		CH = ~~2.11~~ 2.76	2335		
3/25/75	1540		CH = ~~2.09~~ 1.53	315		
4/5/75	1435		2.76	2366		ETR
4/11/75	1325		1.13	852		
4/18/75	1235		1.59	814		
5/2/75	1450		1.03	140		
5/7/75	1540		2.88	1525		ETR
4/25/75	1325		1.69	4175		
5/9/75	1320		CH = ~~2.09~~ 2.36	716		
5/16/75	1340		0.40	103		
5/23/75	1230		1.42	7235		
5/28/75	1440		44.65	77732		
5/29/75	1300		50.77	29150		
6/4/75	1150		~~0.17~~ 0.14	971		ETR
6/24/75	1145		CH = ~~1.64~~ 1.12	855		
7/11/75	1400			35		
7/23/75	1310		CH = ~~0.15~~ 0.16	223		
8/6/75	1325		CH = ~~0.14~~ 0.14	30		ETR

United States Department of the Interior
Geological Survey--Water Resources Division

Unpublished Records
Subject to Revision

Periodic determinations of suspended-sediment discharge

09306415

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment: Mean concentration (mg/l)	Suspended sediment: Discharge (tons per day)	
8/12/75	1130		0.14	207		
8/22/75	1330		0.28	1403		
8/28/75	1100		.051	536		
9/11/75	1035		2.38	31233		
9/11/75	1700		0.91	15610		ETR
9/16/75	1350		2.40	606		

Unpublished Records
Subject to Revision

United States Department of the Interior
Geological Survey--Water Resources Division

Periodic determinations of suspended-sediment discharge

09306420 EVACUATION CREEK NEAR VERNAL, UTAH

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment		
				Mean concentration (mg/l)	Discharge (tons per day)	
10/10/74	1100		0.008	244		
11/11/74	1240		0.01	195		
11/15/74	1410		0.01	179		
11/19/74	1335		0.01	151		
11/21/74	1330		0.009	136		
11/14/74	1300		0.013	49		ETR
11/26/74	1025		0.04	238		
12/5/74	1240		0.26	49		ETR
12/9/74	1455		0.10	92		
12/16/74	1610		0.38	118		
1/27/75	1240		GH = ~~25~~ 0.12	22		
2/4/75	1245		GH = ~~77~~ 0.11	65		
2/11/75	1310		GH = ~~5.7~~ 0.40	179		
2/4/75	1715		0.024	13		
2/25/75	1300		0.29	200		
3/4/75	1200		4.13	2410		
3/4/75	1450		9.89	5950		
3/4/75	1620		9.80	4260		ETR
3/11/75	1420		1.10	1745		
3/17/75	1245		0.72	754		
3/13/75	1350		0.51	180		

Unpublished Records
Subject to Revision

United States Department of the Interior
Geological Survey--Water Resources Division

Periodic determinations of suspended-sediment discharge

09306420

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment		
				Mean concentration (mg/l)	Discharge (tons per day)	
3/21/75	1330	X	0.64	225		
3/26/75	1220		0.33	84		
4/2/75	1240		0.59	600		
4/2/75	1410		1.64	700		
3/24/75	1305		3.14	158		
3/25/75	0940		CH = ~~1.04~~ 7.00	335		
4/9/75	1500		2.03	442		ETR
4/23/75	1355		1.35	705		
5/8/75	1500		2.72	1057		ETR
4/30/75	1340		1.62	473		
5/14/75	1410		0.36	85		
5/23/75	1430		5.63	7445		
5/25/75	1225		46.64	94500		
5/30/75	1320		7.06	5510		
6/20/75	1120		CH = ~~4.11~~	2900		
7/15/75				7000		ETR
8/4/75	1600		0.01	42		ETR
8/13/75	1130		0.28	803		
8/28/75	1235		0.004	370		
9/5/75	1220		CH = ~~0.12~~	45		
9/15/75	1230		0.001	110		

Unpublished Records
Subject to Revision

United States Department of the Interior
Geological Survey--Water Resources Division

Periodic determinations of suspended-sediment discharge

09306422

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment	
				Mean concentration (mg/l)	Discharge (tons per day)
9/29/75	1120		GH = ~~0.12~~	305	
10/30/75	1103		GH = ~~0.32~~ 0.21	3414	
9/10/75	1300		8.14	38000	

ETP

United States Department of the Interior
Geological Survey--Water Resources Division

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Periodic determinations of suspended-sediment discharge

CO 306430 EVACUATION CREEK NR MOUTH

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment: Mean concentration (mg/l)	Suspended sediment: Discharge (tons per day)	
3/21/75	1500		0.25	4		
3/26/75	1520		GH = ~~0.27~~ 0.26	150		
3/28/75	1055		0.29	154		
4/01/75	1430		0.3	60		
3/24/75	1445		GH = ~~0.25~~ 0.28	318		
4/08/75	1340		1.14	2275		
4/09/75	1400		1.34	1250		ETR
4/15/75	1300		0.67	84		
4/16/75	1410		1.42	1330		
4/22/75	1410		GH = ~~2.12~~ 0.49	151		
4/29/75	1405		1.50	664		
5/5/75	1445		2.92	2550		
5/7/75	1400		2.86	1365		ETR
5/13/75	1420		0.75	76		
5/20/75	1430		1.84	1355		
5/30/75	1335		25.5	7320		
5/29/75	1435		47.7	32767		
5/29/75	1213		73.3	19450		
6/2/75	1100		6.1	758		ETR
6/20/75	1445		GH = ~~2.44~~ 4.70	792		
7/7/75	1300		GH = ~~2.45~~ 1.22	87		ETR

United States Department of the Interior
Geological Survey--Water Resources Division

Subject to Revision

Periodic determinations of suspended-sediment discharge

09306430 EVACUATION CREEK NR MOUTH

Date	Time	Water temperature (°C)	Discharge (cfs)	Suspended sediment		
				Mean concentration (mg/l)	Discharge (tons per day)	
7/17/75	1525			84500	QUESTIONABLE	
6/8/75				655000		
7/25/75	1405			186		
8/4/75	1530		0.2	125		ETR
8/18/75	1425		CH = ~~2.25~~ 1.70	757		
9/5/75	1430		CH = ~~2.24~~ 1.38	281		
9/29/75	1245		CH = ~~2.11~~ 3.05	352		
10/30/75	1255		CH = 2.10 2.50	411		
9/18/75	1420		CH = ~~2.11~~ 3.05	329		
9/10/75	1030		6.95	80483		ETR

	July			August			September		
1									
2									
3	2553	1240	0935						
4									
5				541	272	1330			
6									
7									
8									
9							393	24	1326
10	2357	5140	1550						
11									
12									
13									
14				GH=~~4.53~~ 605	1250	1330			
15									
16									
17	844	8910	1235				410	357	1235
18									
19									
20				393	--	1450			
21									
22									
23									
24		391	1324						
25							GH=~~4.72~~ 610	198	1315
26									
27				386	59	1235			
28									
29									
30									
31									
tal									

Total discharge for period year (cfs-days)

Total load for period year (tons)

6500

Unpublished Records
Subject to Revision

UNITED STATES DEPARTMENT
GEOLOGICAL SURVEY -- WAT

Stream discharge, concentration and load of suspended sediment at
for water year October 19

Instantaneous Values

Day	October			November			December		
	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day, Time	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day, Time	discharge (cfs)	Suspended Sediment: concentration (mg/l)	Suspended Sediment: Tons per day, Time
1									
2							181	124	1300
3							238	72	1415
4									
5				64=2.7	113	1530			
6									
7									
8									
9	447	103	1200						
10									
11				476	108	1400			
12				410	147	1100			
13				489	75	1500			
14									
15				492	40	1100			
16							38	218	1120
17									
18									
19				432	22	1230			
20									
21				467	99	1430			
22									
23									
24							236	59	1155
25									
26									
27									
28									
29									
30									
31									

Unpublished Records
Subject to Revision

24 September 19 25

Instantaneous Values

Day	January			February			March		
	~~Mean~~ discharge (cfs)	Suspended Sediment ~~Mean~~ concentration (mg/l)	Suspended Sediment ~~Tons per day~~ Time	~~Mean~~ discharge (cfs)	Suspended Sediment ~~Mean~~ concentration (mg/l)	Suspended Sediment ~~Tons per day~~ Time	~~Mean~~ discharge (cfs)	Suspended Sediment ~~Mean~~ concentration (mg/l)	Suspended Sediment ~~Tons per day~~ Time
1									
2	445	60	1400						
3				412	137	1430	595	1580	1665
4									
5				354	198	1610	610	686	1550
6	255	29	1300						
7				401	176	1420	634	1860	1430
8	64=3.26	27	1030						
9									
10				416	270	1150	594	1760	1630
11									
				64=3.33	350	1450	584	2020	1615
13	314	34	1330						
14				64=3.11	197	1245	585	1560	1445
15		43	1445						
16									
17	440	76	1445	396	221	1110			
18									
19				362	348	1510			
20	354	178	1530						
21					281	1410	497	1220	1100
22	314	54	1100						
23									
24	396	190	1545	306	291	1410			
25									
26				358	421	1450	422	519	1100
27	475	272	1540						
28				523	1940	1600	415	554	1400
	399	163	1525						
30									
31		42	1030				233	230	1040

E = Estimated

Subject to Revision

	April			May			June		
1	350	384	1050	509	466	1150		1600	E
2	GH=2.66	358	1010		400	E	1670	1890	1710
3	386	274	1020		350	E	1810	3080	1110
4		250	E		350	E	2156	2830	0915
5		500	E	544	420	1520		4000	E
6		750	E	580	718	1345		5000	E
7	530	949	1455	600	748	1425		6000	E
8	485	1100	1000	593	616	1125	GH	7000	E
9		250	E		550	E	6.17	6920	1130
10	437	391	1240		450	E	6.44	3200	1000
11		350	E		350	E	5.61	2250	1200
12		300	E	516	464	1100		2260	1500
13		250	E	670	924	1150		1800	E
14	377	250	1020	682	1670	0955		3000	E
15	GH=3.57	248	1345	883	2850	1410		4000	E
16	GH=2.58	233	0945	1020	5040	1510		5000	E
17	431	310	1115		6000	E		5000	E
18		750	E		7000	E		2100	1140
19		400	E	2044	8080	1200		1900	1030
20		750	E	1706	5660	1230		1800	E
21	446	380	1120	2223	6150	1220		1600	E
22	430	265	1320	2700	6450	1510		1600	E
23		300	E	2040	4620	1120		1520	1420
24	477	421	1150		3400	E		1440	0915
25		600	E		2400	E	4.77	1280	1415
26		750	E	1736	2520	1130	5.11	1280	1040
27		900	E		2400	E	4.90	1390	1325
28	628	1090	1110	1840	3080	1245		1200	E
29	GH=3.00	934	0955	2017	3910	1110		1200	E
30	600	606	1400	1820	3500	1155	5.13	1300	1355
31					2000	E			
Total									

Maximum daily, _____ tons | Minimum daily, _____ tons

Discharge					Concentration					Load				
Copied					Copied					Computed				
Checked					Checked					Checked				
Date					Date					Date				

	GH			August			September		
1	5.20	1380	1415	GH=3.15	3100	1020			
2	5.22	1340	1345						
3	5.30	1440	1000				GH=2.50	19	1410
4		1400	E	578	297	1130			
5		1400	E						
6	8	1300	E						
7	2560	1280	1515						
8		1300	E	GH=2.80	204	1000	320	24	1530
9	GH=4.53	3250							
10	2100	3260	1515						
11	1700	2500	1330						
12		2300	E	480	192	1000			
13		2100	E	559	1500	1435			
14		1900	E						
15	GH=4.73	1820	1335						
16		2000	E						
17		3500	1150				GH=2.73	381	1410
18	1350	2200	1225						
19		1700	E	GH=2.67	208	1435			
20		1300	E						
21		800	E						
22	1970	254	1225						
23		600	E						
24	800	551	1500						
25	760	554	1120	GH=2.64	82	1330	GH=2.73	194	1145
26									
27									
28	680	464	1400						
29				GH=2.58	56	950			
30	GH=3.05	1640	1445						
31									
Total									

Total discharge for period / year (cfs-days)

Total load for period / year (tons)

"Subject to revision"

Sta# 09306600

UNITED STATES DEPARTMEN
GEOLOGICAL SURVEY -- WATE

Stream discharge, concentration and load of suspended sediment of ___
for water year October 19__

Day	October			November			December		
	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: ~~Tons per day~~ Tons	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: ~~Tons per day~~ Tons	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: ~~Tons per day~~ Tons
1									
2					312				
3									
4							337	219	1540
5									
6									
7				444	198	1465			
8	466	253	1715						
9									
10		322							
11		337							
12		234		485	312	1500	286	467	1400
13								1	
14				455	349	1460			
15		384							
16							387	490	1445
17									
18				422	200	1465			
19							~~420~~ GH=~~390~~	372	1300
20				427	182	1460			
21									
22									
23	462	379	1425				405	176	1430
24									
25				~~452~~ GH=~~397~~	220	1140			
26									
27				428	199	1460			
28									
29									
30							422	294	1545
31	473	299	1500						

OF THE INTERIOR
ESOURCES DIVISION
306600

Subject to revision

September 1975

	January			February			March		
	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day
							GH		
				350	121	1115	5.54	598	1200
				GH					
				5.29	113	1430			
	346	276	1400						
	GH=~~4.81~~ 5.50	99	1450						
							4.36	1140	1145
2									
3				5.06	160	1135			
4	265	80	1415				4.27	1490?	1230
5									
6	280	23	1030						
7							DISCH		
8				5.37	20	1025	381	1180	1450
9									
0				4.76	114	1000			
1	GH=~~5.22~~ 1113	216	1500				482	1110	1420
2									
3	329	302	1300						
4									
5				4.74	151	1150	449	574	1435
6									
27				4.90	301	1415			
28	GH=5.07	141	1430						
29									
30	GH=5.02	119	1115						
31									

Complete Record
Subject to revision

	April			May			June		
1				488	600	1400			
2									
3	407	316	1400						
4									
5							2384	3170	1450
6				591	675	1615			
7									
8	~~452~~ GH=~~4.38~~	1060	1330	601	808	1415			
9									
10	392	500	1415				~~2545~~ GH=~~7.21~~	3460	1315
11									
12							~~2350~~ GH=7.20	2520	1330
13									
14									
15									
16									
17	430	411	1460						
18									
19									
20									
21									
22				2741	6585	1330			
23									
24	491	520	1405						
25							~~2350~~		
26							GH=~~7.20~~	1965	1530
27									
28									
29				1956	6195	1605			
30									
31									
Total									

Maximum daily, tons | Minimum daily, tons

Discharge		Concentration		Load	
Copied		Copied		Computed	
Checked		Checked		Checked	
Date		Date		Date	

July 5 to revision

	GH July			August			September		
1									
2									
3	~~3030~~ ~~7.32~~	1340	1225						
4							~~384~~ GH=~~3.84~~	82	1110
5									
6				496	322	1630			
7									
8									
9	~~2202~~ ~~6.72~~	3600	1315						
10							377	11,700	1400
11									
12									
13				~~630~~ GH=~~4.36~~	6240	1150			
14									
15									
16							505 GH=~~4.11~~	2320	1230
17	~~1546~~ ~~5.88~~	6960	1445						
18									
19									
20				472 GH=~~4.02~~	199	1315			
21									
22									
23									
24	~~233~~ ~~4.93~~	1560	1350						
25									
26							492 GH=~~4.08~~	220	1225
27				452 GH=~~3.98~~	148	1220			
28									
29									
30									
31									
Total									

Total discharge for period / year (cfs-days)

Total load for period / year (tons)

subject to revision -

Sta # 09306700

UNITED STATES DEPARTM
GEOLOGICAL SURVEY -- WA

Stream discharge, concentration and load of suspended sediment of /
for water year October 19

Day	October			November			December		
	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day
1				496	131	1340			
2									
3							273	118	1300
4									
5									
6				~~GH= 4.08~~	161	1250			
7									
8	464	242	1345						
9									
10									
11									
12				451	1052	1325			
13				416	95	1530			
14				391	126	1430			
15									
16									
17									
18									
19									
20				400	157	1200			
21									
22									
23									
24									
25				445	153	1915			
26									
27				414	334	1235			
28									
29	GH= 4.08	942	1300						
30									
31									

Subject to Revision

OF THE INTERIOR
RESOURCES DIVISION

[illegible] below Asphalt Wash near [illegible] Utah [illegible]

September 1975

January			February			March		
Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day	Mean discharge (cfs)	Suspended Sediment: Mean concentration (mg/l)	Suspended Sediment: Tons per day
			400	139	1205	550	[illegible]	1115
			GH 5.54	172	1330	GH=5.74	[illegible]	1200
GH=~~5.56~~	153	1415						
GH=5.52	298	1520	5.57	145	1115	GH=5.81	[illegible]	1100
			5.68	330	1355	GH=6.96	[illegible]	1225
			5.65	176	1145	GH=4.45	[illegible]	1220
			5.58	132	1035			
200	141	1220						
498	233	1300	5.60	258	1410	443	[illegible]	1240
			5.53	187	1115	408	[illegible]	1350
500	275	1045						
			5.26	137	1115			
GH=5.36	155	1155	5.09	149	1130	GH=~~4.2~~ 510	634	1350
			5.23	207	1155	430	[illegible]	1360
GH=5.94	458	1310						
			5.63	265	1315	GH=4.09 455	[illegible]	1125
GH=5.74	225	1240						
GH=5.27	176	1325				350	470	1250

5-11

July 1 to revision

	April			May			June		
1									
2									
3	415	451	1250						
4	376	326	1500				~~2290~~	3655	1126
5							GH		
6									
7	GH ~~4.55~~	1930	1440						
8									
9								1935	1430
10									
11							~~2793~~		
12							~~719~~	[illegible]	1315
13									
14	GH ~~4.41~~	420	1255						
15				915	2370	1545			
16							~~3254~~ ~~744~~	3050	1230
17									
18									
19				2200	5705	1405			
20									
21	440	706	1365						
22				2675	7195	1400			
23							~~3195~~		
24	435	746	1400				~~655~~	1890	1245
25									
26							~~2474~~		
27				1700	3260	1465	~~1776~~	1930	1120
28									
29				1973	~~4255~~	1455			
30									
31									
Total									

Maximum daily, tons | Minimum daily, tons

Discharge		Concentration		Load	
Copied		Copied		Computed	
Checked		Checked		Checked	
Date		Date		Date	

Subject to revision

	July			G.H August			G.H September		
1	GH=~~7.10~~ 2.02	1890	1200						
2							~~3.67~~ 266	68	1500
3									
4									
5									
6									
7					246				
8	GH=~~6.15~~ ~~1.85~~	3133	1600						
9							~~3.61~~ 239	48	1400
10									
11									
12									
13									
14				~~3.78~~ 400	4560	1345			
15									
16	GH=~~5.27~~ 1.89	4717	1450						
17									
18									
19									
20									
21									
22				~~3.9~~ 360	178	1430	~~3.89~~ 355	208	1430
23	GH=~~4.79~~ ~~3.54~~	1129							
24									
25									
26									
27									
28				~~3.77~~ 306	123	1325			
29	Q=600	388	1310				~~4.01~~ 215	261	1425
30									
31									
Total									

Total discharge for period / year (cfs-days)

Total load for period / year (tons)

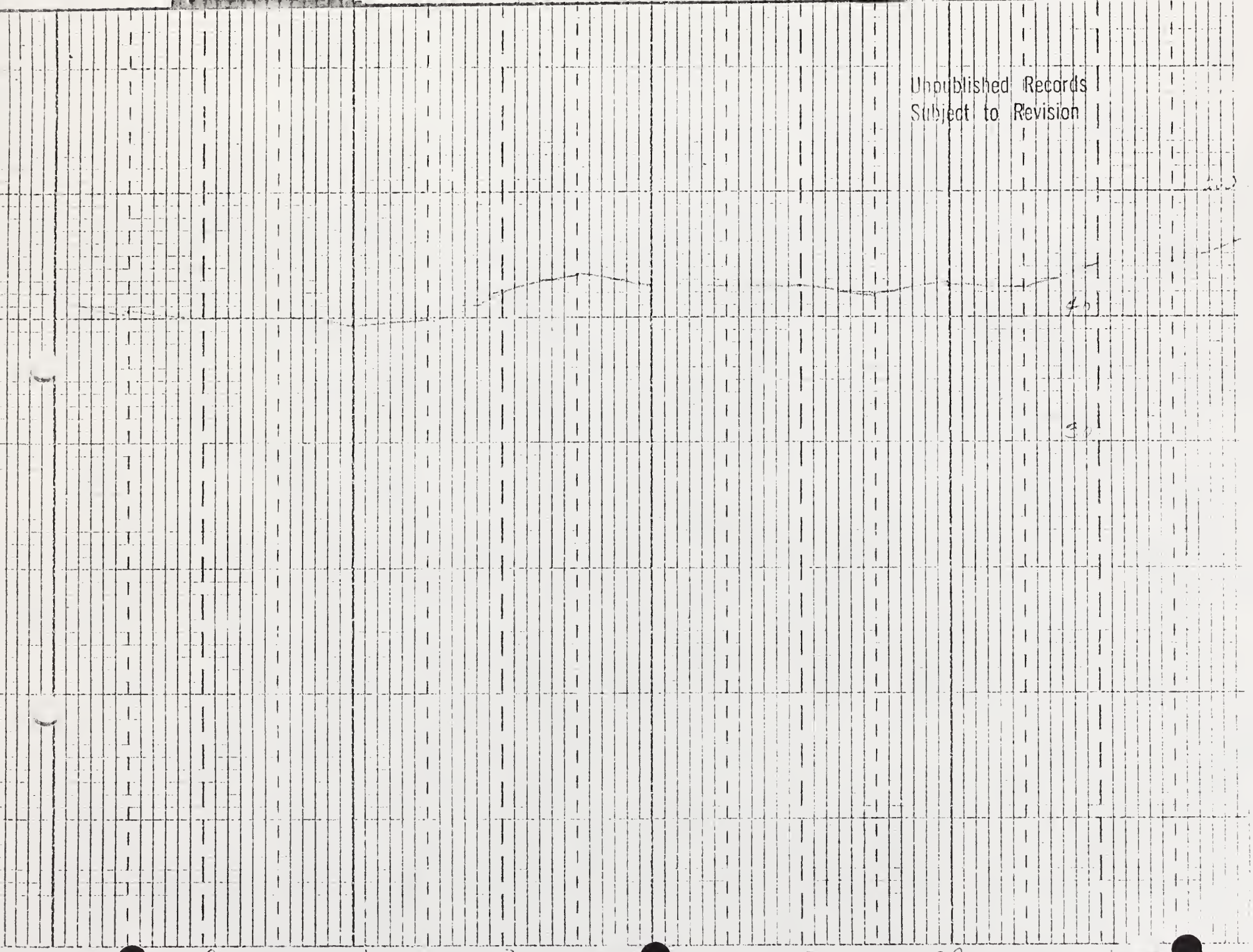
09306500

Unpublished Records
Subject to Revision

200

100

Unpublished Records
Subject to Revision



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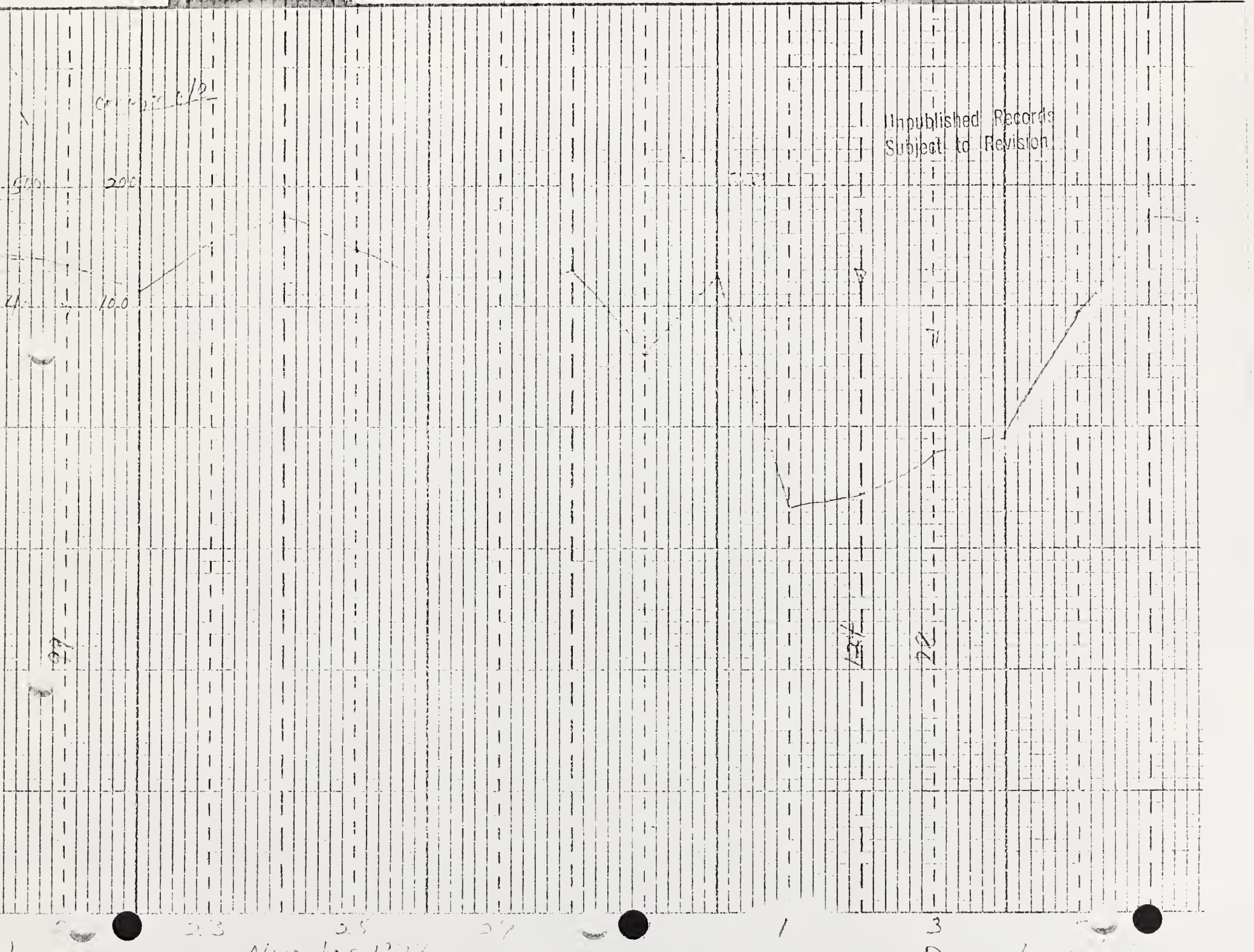
Subject to Revision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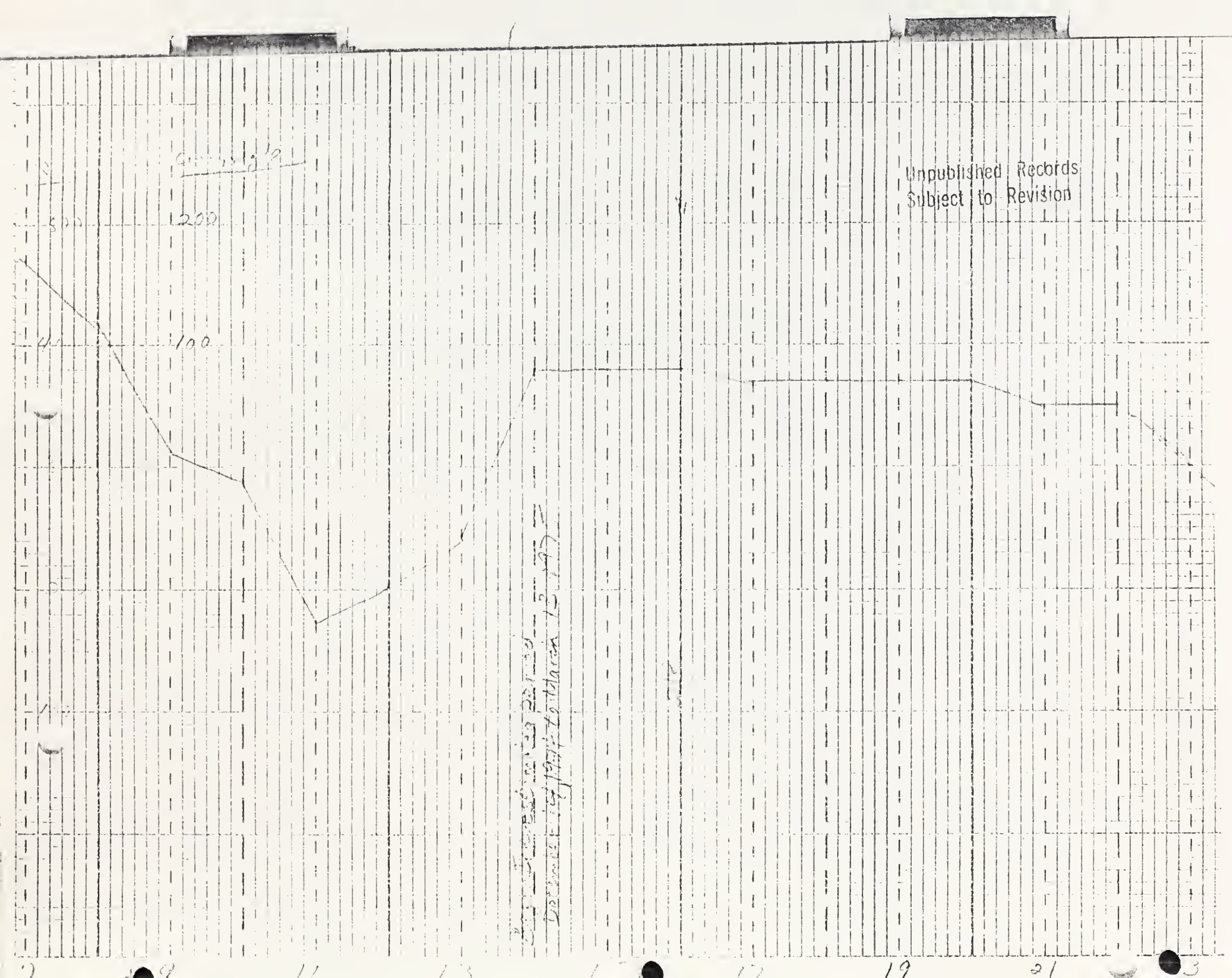
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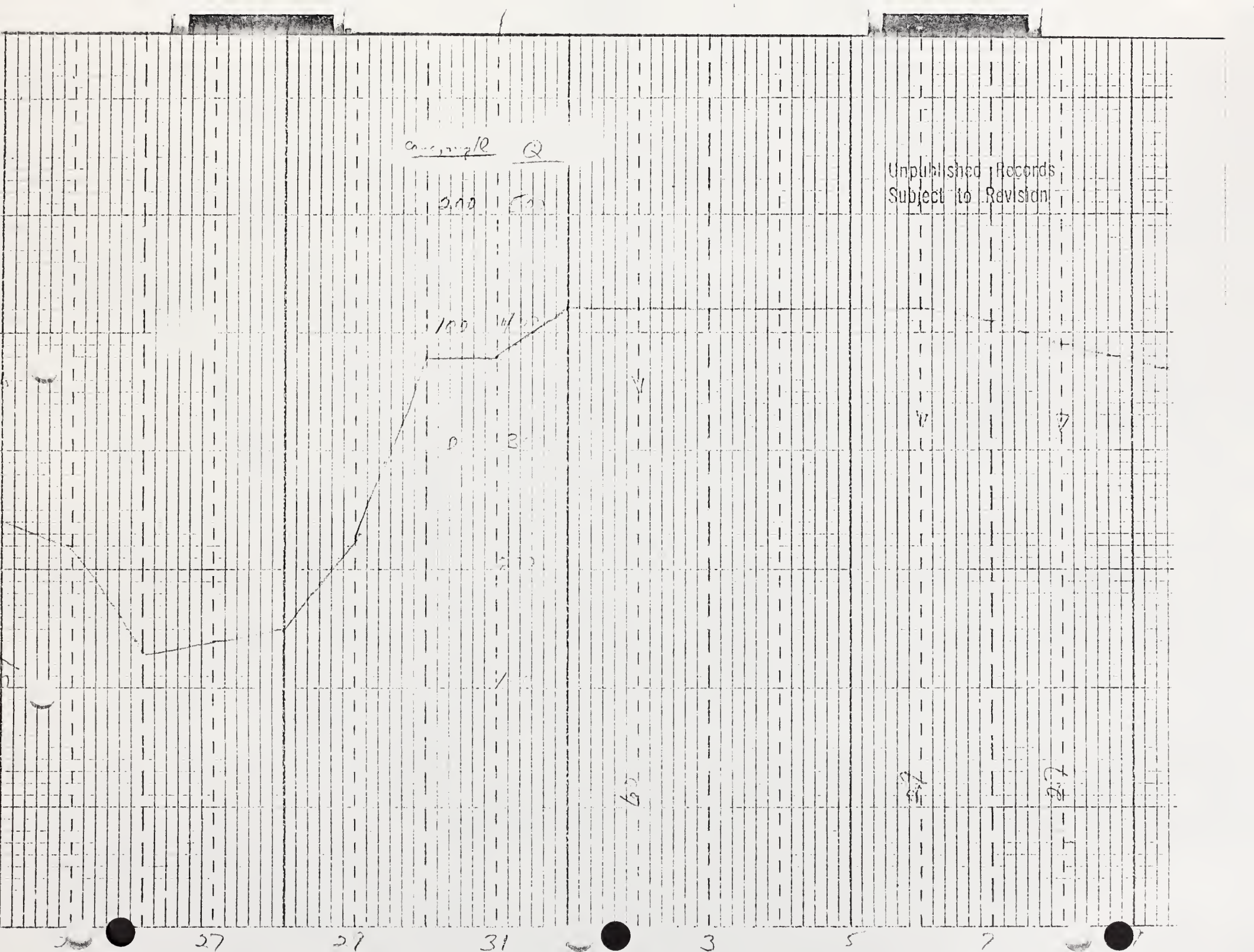
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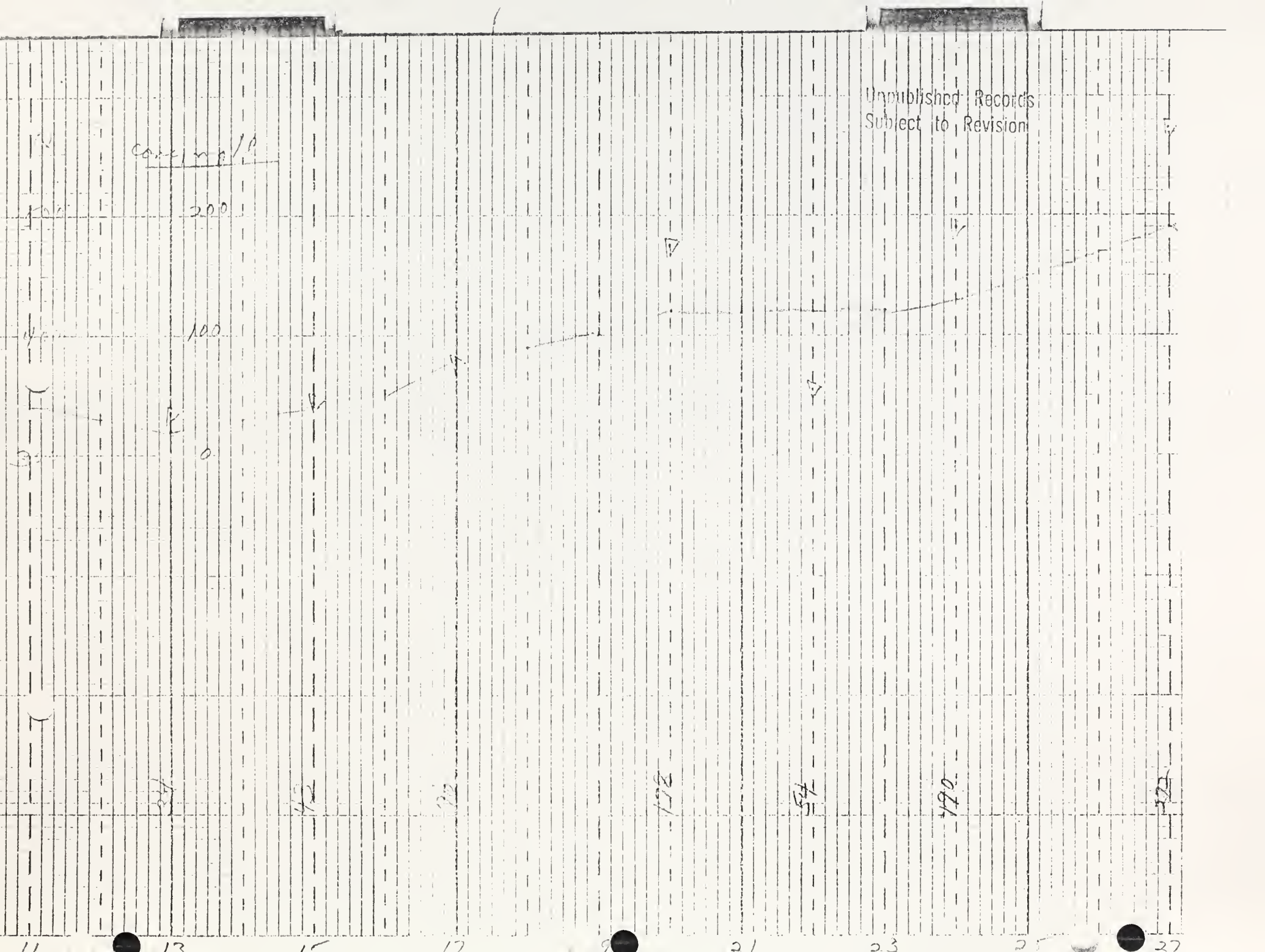

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Unpublished records
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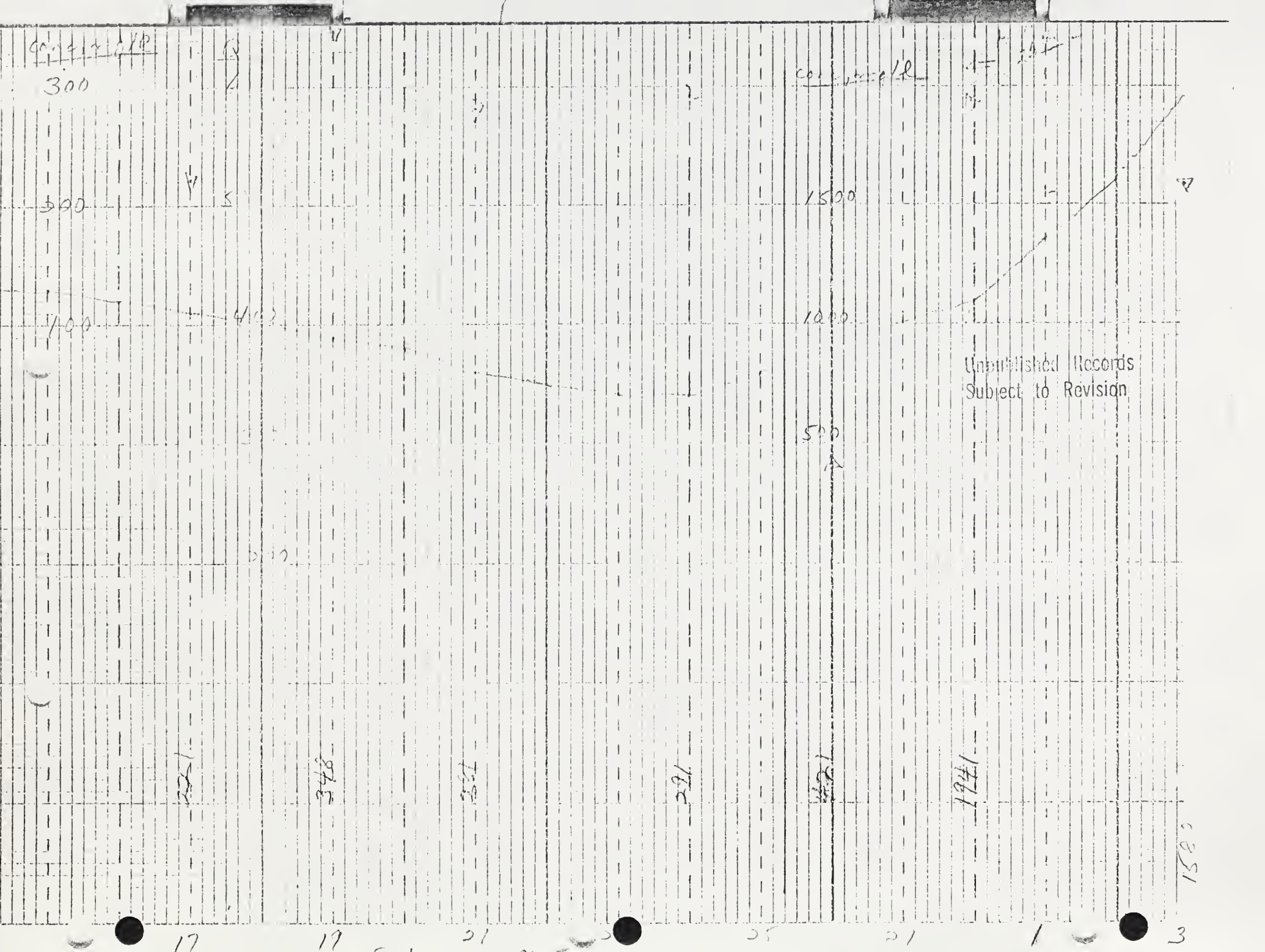
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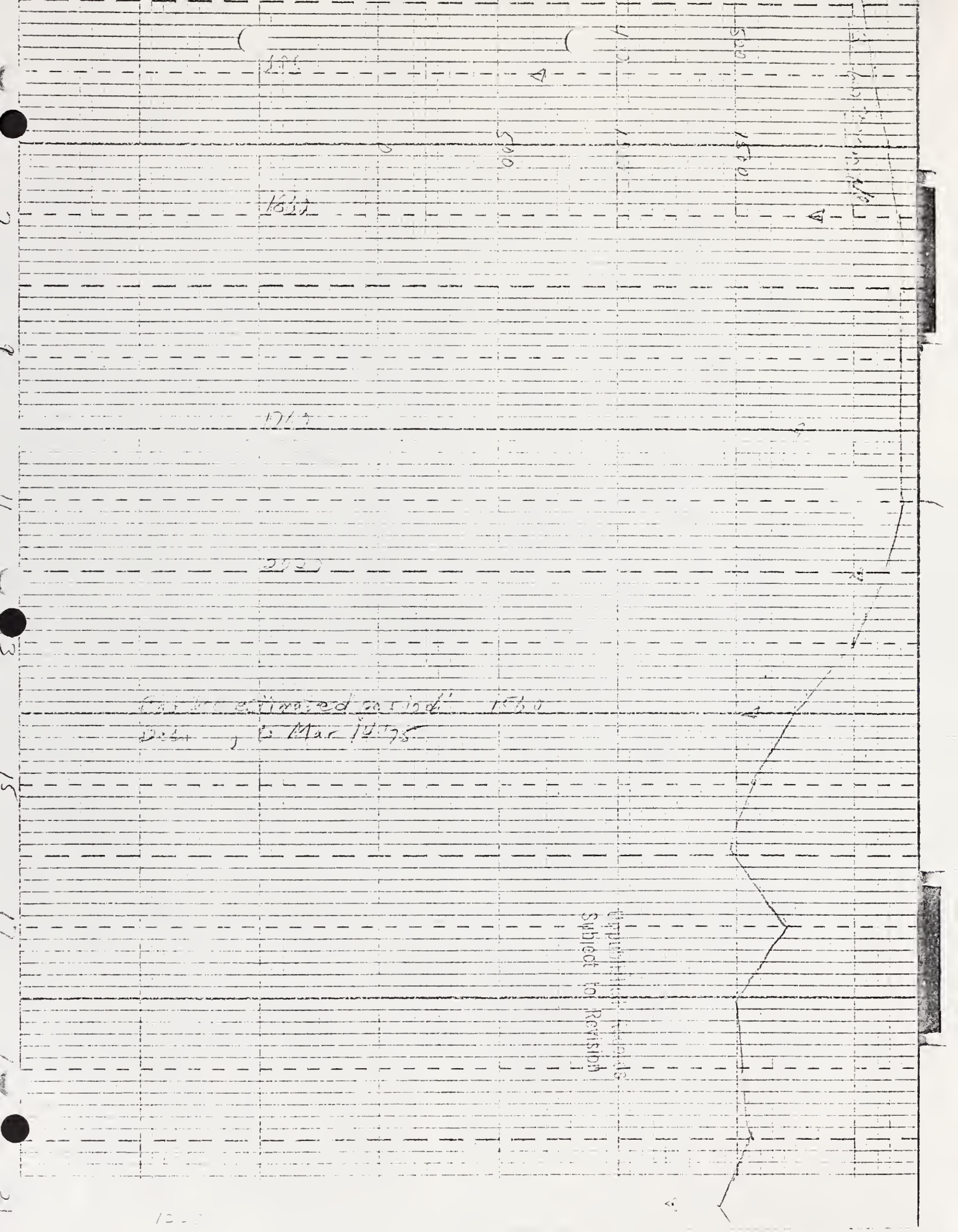
Unpublished Records
Subject to Revision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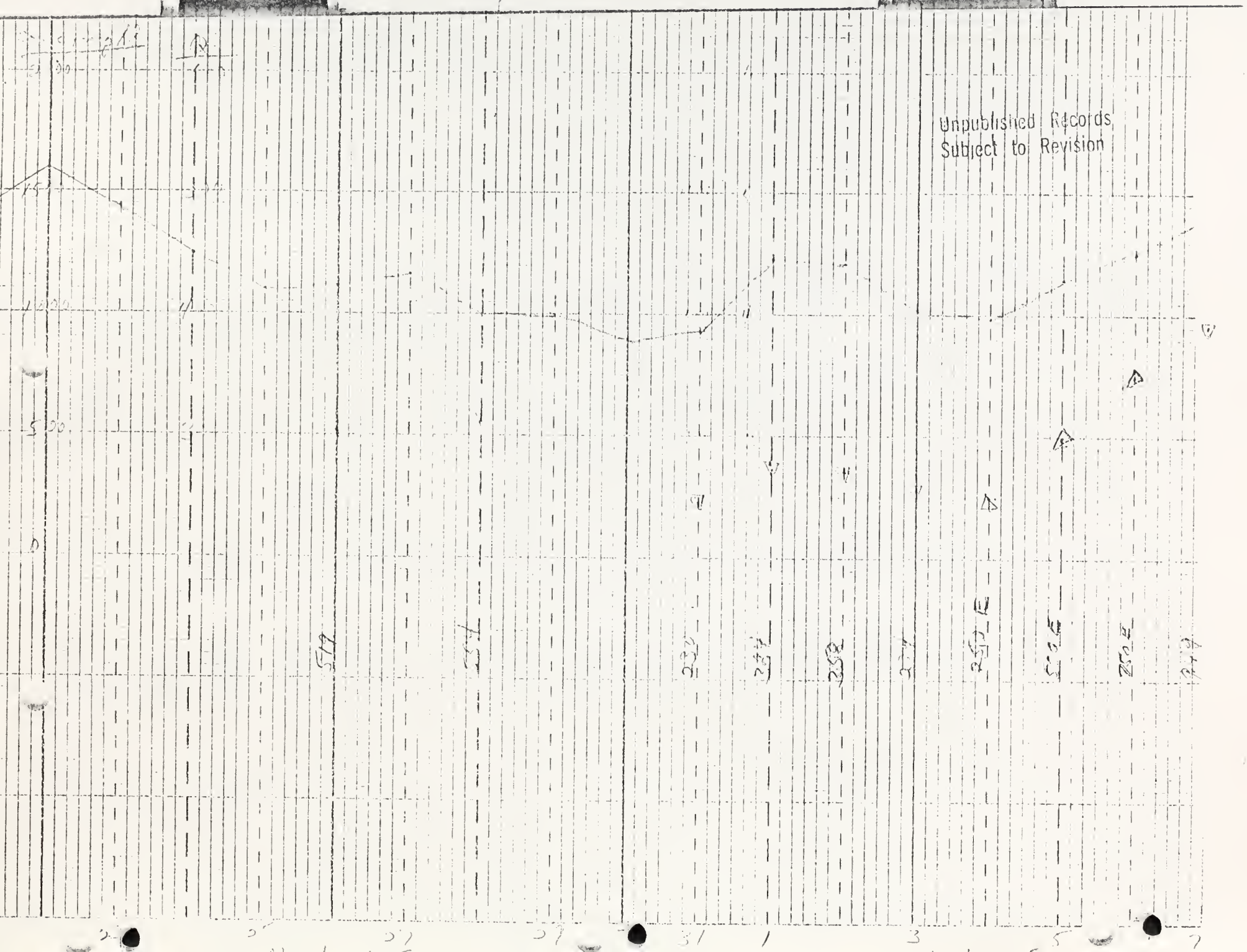
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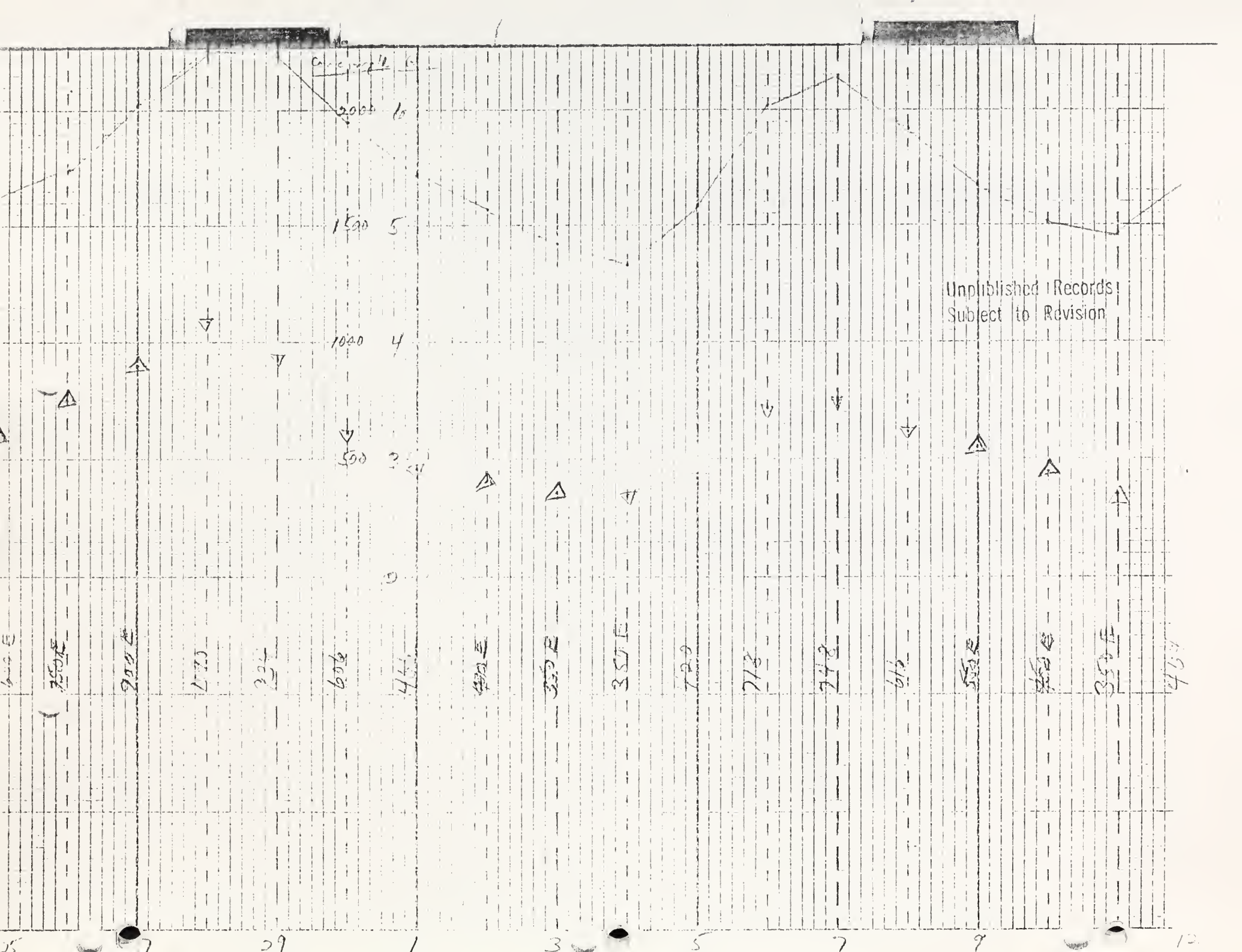
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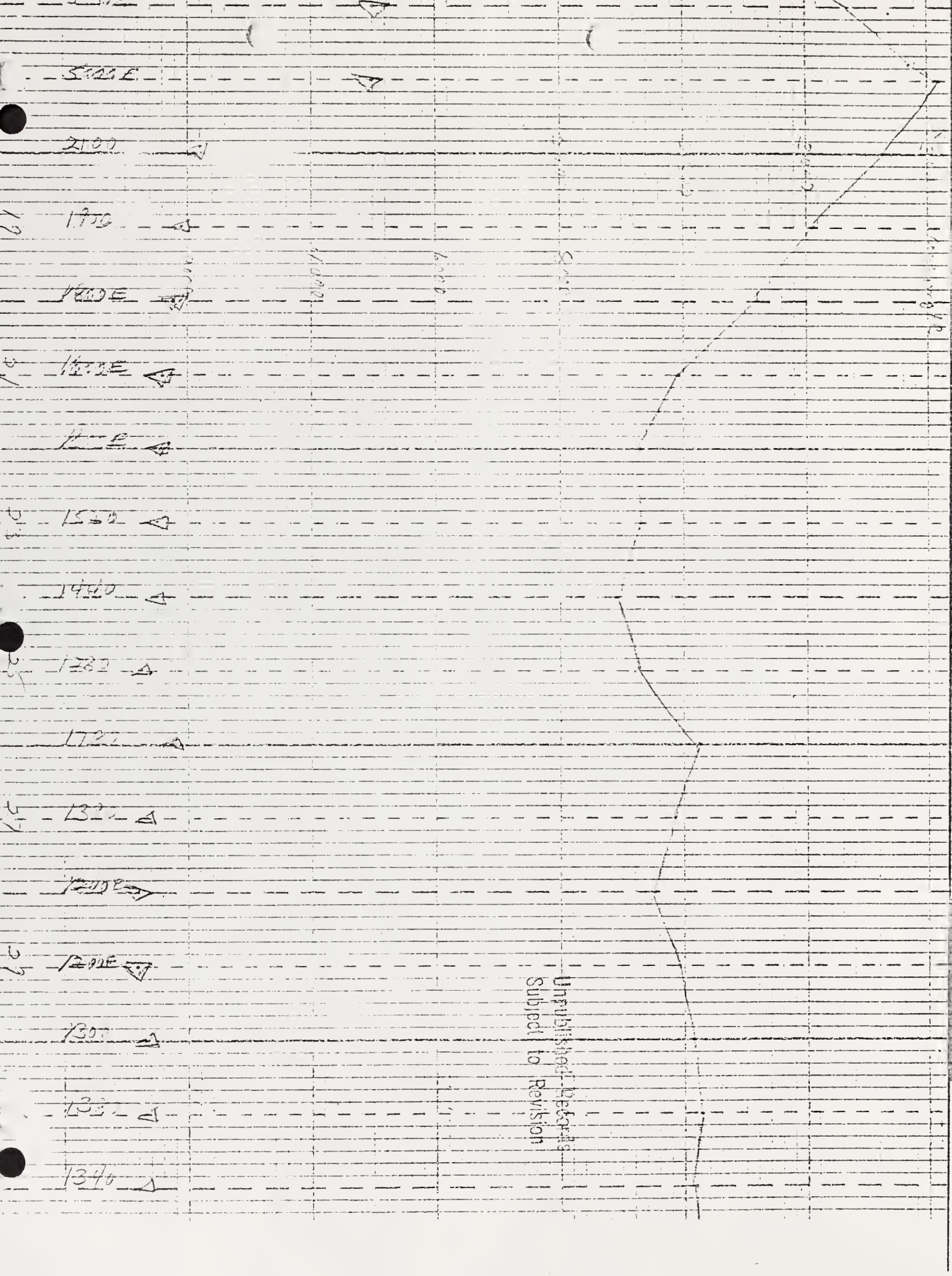

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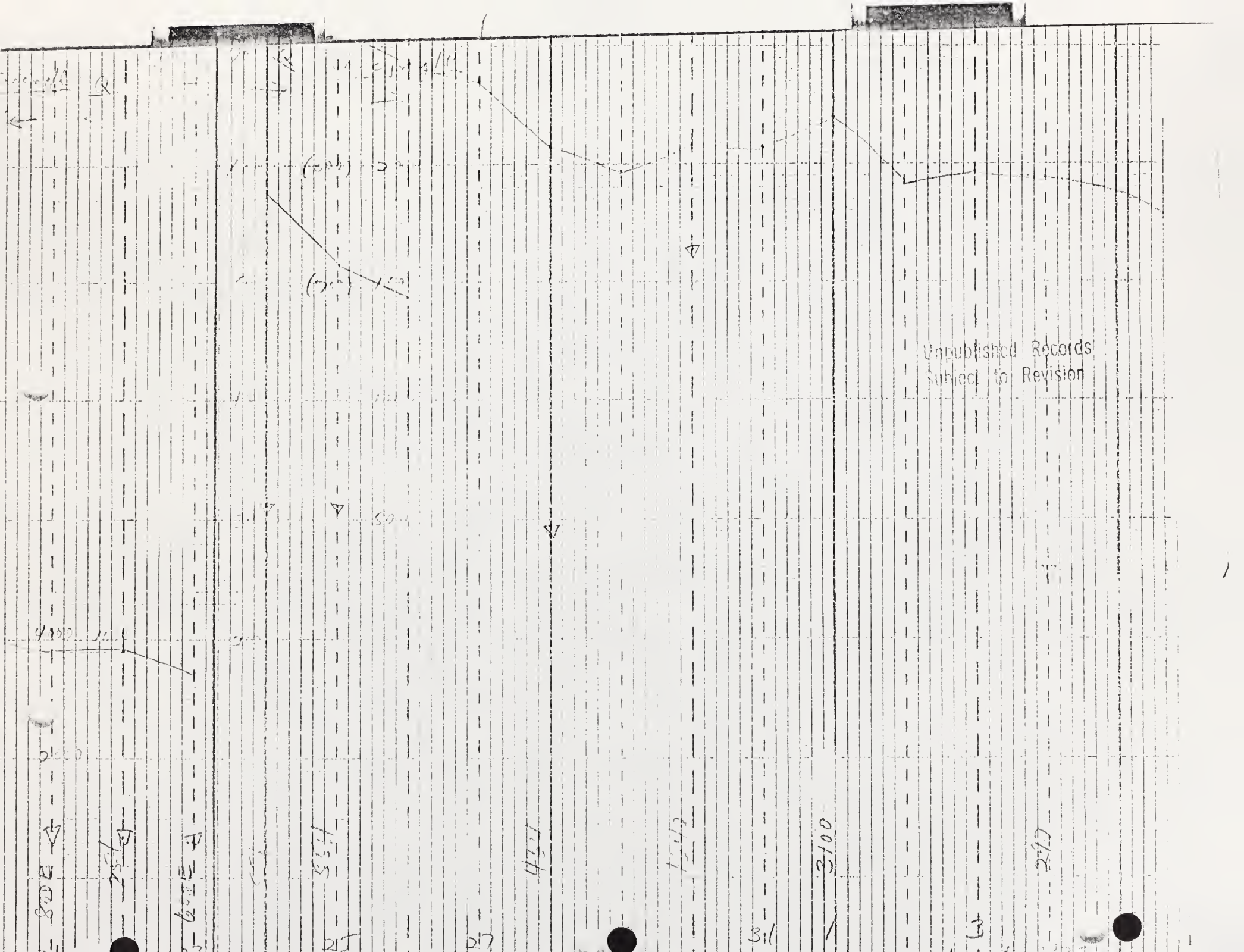
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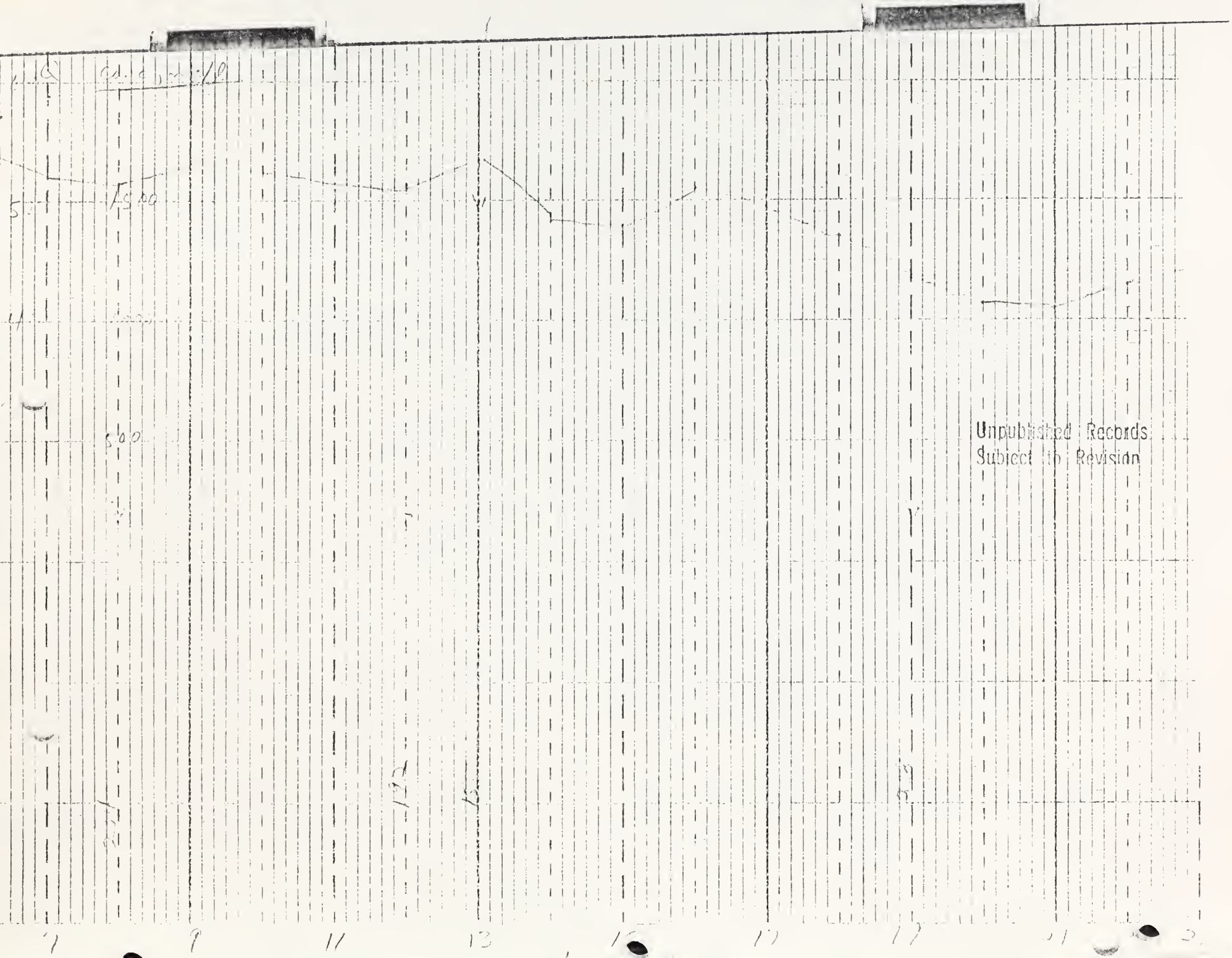
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Subject to Revision

Unpublished Records
Subject to Revision

OPTIONAL FORM NO. 10
MAY 1973 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

NOV 24 1975
SALT LAKE CITY, UTAH
WATER RESOURCES DIVISION

TO: D. W. Finn, WRD
Salt Lake City, Utah

FROM: B. J. Anderson, WRD
Hydrologic Laboratory

DATE: November 21, 1975

SUBJECT: PROGRAMS AND PLANS--Mineralogy of samples 75UT21-53; 76UT4-9; and 76UT10-21

The mineralogy of these bulk samples is given in the attached tables. The procedure used is similar to that used by L. Schultz (U.S.G.S. Prof. Paper 391-C). Another publication of possible relevance is U.S.G.S. Prof. Paper 833 by Brobst and Tucker on the mineralogy of the Parachute Creek member of the Green River Formation. They record all of their X-ray data in terms of peak heights because of the difficulty in obtaining reasonable percentage values. Schultz considers totals of percentages between 90 and 105 to be acceptable and most of these samples fall within this range. The low totals for 76UT4 and 5 are due to the presence of amorphous material (presumably organic). The background on the X-ray patterns of these samples is definitely higher than that of the other samples. I have no explanation for other samples which give low totals. Some of these will be run again.

Percentages for potassium feldspar and for dolomite could not always be determined because of interference from peaks of plagioclase feldspar. I have not attempted to identify the type of potassium feldspar or the particular plagioclase present. Generally, such an X-ray determination requires a fairly pure sample. This determination would be easier to do using the petrographic microscope. The plagioclase is a predominantly sodic type.

Clay mineralogy has been attempted on some of the samples and additional work will be done on this. The clay minerals present consist primarily of mixed layer types with admixed chlorite and illite. There are interlayers present in some of these clays which prevent normal behavior on treatment with ethylene glycol or with heating. Some of these interlayers can be removed by dispersion and sodium saturation.

The most important addition to the sampling program would be to take suspended sediment samples from the White River and any other flowing stream in the area several times a year. Samples taken immediately after a rain storm would be the most useful but would be difficult to obtain. For the X-ray analysis I need at least five grams of sample. Additional sampling sites for stream bed samples might include another one or two in Southam Canyon within the lease tracts and similarly along Evacuation Creek in Sections 24 or 25, T. 10S., R. 24E. I am not sure of the advisability of bedrock samples. They would be

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of use only if they could be correlated to definite units that were representative of large areas. The sort of information I would need would only be given in a detailed geologic report such as a thesis. I have not had time yet to check the library here for such information.

Thank you for sending the maps I requested.

B. J. Anderson
Geologist

Attachments

cc: District Chief

City & State: Salt Lake City, Utah

Proj. name & no.: Oil Shale Project #4649113

County:

Date samples received in lab: September 16, 1975

Latest date results needed: December 1975

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

BY LABORATORY

Laboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYS 8/
76UT10	SC			1	09306400 7-10-75	Bed Material						<2mm di Xb+X >2mm dia
11	SC			2	09306405 7-10-75							
12				3	09306410 7-11-75							
13				4	09306415 7-11-75							
14				5	09306430 7-7-75							
15				6	09306500 7-9-75							
16				7	09306600 7-9-75							
17				8	09306605 7-10-75							
18				9	09306610 7-10-75							
19				10	09306620 7-10-75							

20FR75

City & State: Salt Lake City, Utah

Proj. name & no.: Oil Shale Project #4649113

County:

Date samples received in lab:

Latest date results needed: December 1975

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

BY LABORATORY

Laboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT20	Sc			11	7-8-75 09306625	Stream Bed Material						< 2mm dia, X6 + Xc; > 2mm dia.
21	"			12	7-8-75 09306700	"						"

20FR75

Proj. name & no.: Oil Shale 46491300

County:

Date samples received in lab: 8/18/75

Latest date results needed: Sept. 15, 1975

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

Laboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT4	SB			1	Raw Oil Shale Tosco 8-6-75							Xc
5	SB			2	Raw Oil Shale Tosco 8-6-75							Xc
6	SB			3	Spent Oil Shale Tosco 8-6-75							Xc
7	SB			4	Spent Oil Shale (leached) Tosco 8-6-75							Xc
8	SB			5	Spent Oil Shale Parahe							Xc
9	SB			6	Stream Bottom 09306700 7-8-75							Xc

20FR75

eturn Report to: USGS, WRD, 125 S. State Rm [illegible], SLC, UT 84138

atest Date esults needed: 6-30-75

SAMPLE-AN[illegible]YSIS REQUEST

Job. No. (Lab.use) _____

and No.: 4649-[illegible]00

Sample No's: (Lab.use) _____

Page 1 of 3 pages

abora-tory ample No. Lab.use)	Sample type 1/	Depth, ft. ~~From~~ # of cartons	Depth, ft. To	Field No. (if any)	Location SW Site #	Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permea-bility	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
75UT21	SC	1		1	09306400	11-13-74	Stream Bed Sample					
22		2		2	09306400	1-7-75						
23		2		3	09306405	11-13-74						
24		2		4	09306405	1-7-75						
25		1		5	09306415	11-14-74						
26		1		6	09306417	1-21-75						
27		2		7	09306420	11-14-74						
28		1		8	09306420	1-8-75						
29		2		9	09306425	11-14-74						
30		1		10	09306425	1-8-75						
31		2		11	09306430	11-12-74						
32		2		12	09306430	1-9-75						
33		1		13	09306500	11-12-74						

Other: <2mm dia. — Mineral Id by X-ray diff. + clay Mineral Id.

/ Sample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
/ Sp. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
/ Other analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits; PL = Plastic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension; pH; GC = Gypsum content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility; SC = Soil conductivity; HM = Heavy mineral; FF = Formation factor.

Forward copies 1-3 to L
Copy 4 is packing list
Retain copy 5

GPO 88800

Return Report to: USGS, WRD, 125 S. State, Rm 800, SLC, UT 84138

Latest Date results needed: 6-30-75

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use)

and No. 4649-00[illegible]0

Sample No's: (Lab.use)

Page 2 of 3 pages

Laboratory Sample No. (Lab.use)	Sample type 1/	Depth, ft. ~~From~~ # of cartons	Depth, ft. To	Field No. (if any)	Location SW Site #	Location Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permeability	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
75UT34	SC	2		14	09306500	1-6-75	Stream Bed Sample					
35		1		15	09306600	11-14-74						
36		2		16	09306600	1-8-75						
37		2		17	09306605	11-14-74						
38		2		18	09306605	1-6-75						
39		1		19	09306610	11-14-74						
40		2		20	09306610	1-9-75						
41		1		21	09306620	11-13-74						
42		2		22	09306620	1-6-75						
43		2		23	09306625	11-13-74						
44		1		24	09306625	1-6-75						
45		1		25	09306700	11-13-74						
46		1		26	09306700	1-7-75						

<2mm dia. - Mineral Id by X-ray + Clay Mineral Id.

>2mm dia - Lithologic Description

1/ Sample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
2/ Sp. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
3/ Other analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits; PL = Plastic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension; pH; GC = Gypsum content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility; SC = Soil conductivity; HM = Heavy mineral; FF = Formation factor.

Forward copies 1-3 to La
Copy 4 is packing list
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GPO 855000

HYDROLOGIC LABORATORY

SAMPLE-ANALYSIS REQUEST

Date: 4-30-75
Return Report to: USGS, WRD, 125 S. State, Rm 8000, SLC, UT 84138
Latest Date results needed: 6-30-75

Job. No. (Lab.use)

and No. 4649-00[illegible]
Sample No's: (Lab.use)
Page 3 of 3 pages

Laboratory Sample No. (Lab.use)	Sample type 1/	Depth, ft. ~~From~~ # of Cartons	Depth, ft. To	Field No. (if any)	Location	Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permeability	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
75UT47	SC	1		27	(D-10-25) 7c	1-14-75	Stream Bed Sample					
48	SC	1		28	(D-10-25) 7b	1-14-75						
49	SC	1		29	(D-10-24) 11a	1-14-75						
50	SC	1		30	(D-10-24) 14ab	1-14-75						
51	SC	1		31	(D-10-24) 14bb	1-14-75						
52	SC	1		32	(D-10-24) 15b	1-8-75						
53	SC	1		33	(D-10-24) 18d	1-14-75						
					Above seven samples are from tributary channels to White River							

Other: <2mm dia. - Mineral Id. by X-ray + Clay Mineral Id.
>2mm dia. - Lithologic Description

1/ Sample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
2/ Sp. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
3/ Other analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits; PL = Plastic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension; pH; GC = Gypsum content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility; SC = Soil conductivity; HM = Heavy mineral; FF = Formation factor.

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Unpublished Records
Subject to Revision

Mineralogy of samples 75UT21-53

Laboratory sample number	Quartz	Potassium Feldspar	Plagioclase Feldspar	Calcite	Dolomite	Clay Minerals	Analcime	Total
75UT21 S-1	61	7	6	6	5	15	1	101
22 S-1	54	8	7	9	7	15	1	101
23 S-5	22	4	6	14	25	20	3	94
24 S-5	25	9	24	11	9	15	3	96
25 S-7	40	6	6	12	14	15	2	95
26 S-15	15	6	10	26	19	20	4	100
27 S-6	44	8	8	11	12	15	1	99
28 S-6	21	4	4	17	27	10	3	86
29 S-8	19	≤7	21	14	9	20	5	89+
30 S-8	18	≤9	20	16	12	20	4	90+
31 S-2	34	6	8	14	18	15	2	97
32 S-2	24	6	8	18	18	15	3	92
33 S-3	42	7	6	12	10	15	1	93
34 S-3	49	8	7	11	9	20	1	105
35 S-4	51	8	7	8	8	10	1	93
36 S-4	57	9	6	9	8	15	1	105
37 S-9	27	11	18	8	4	15	9	92
38 S-9	27	11	19	9	6	10	12	94
39 S-13	25	13	16	10	4	5	9	82
40 S-13	29	18	27	10	6	5	9	104
41 S-10	25	11	20	11	5	15	6	93
42 S-10	29	13	28	11	≤5	10	7	98+
43 S-12	27	11	22	11	6	20	7	104
44 S-12	28	6	9	15	19	15	5	97
45 S-11	59	8	8	7	6	15	1	104
46 S-11	51	8	8	12	10	10	1	100
47	33	6	10	16	14	15	2	96
48	44	8	8	12	13	20	1	106
49	23	≤10	33	5	3	10	6	80+
50	27	≤15	41	7	4	10	5	94+
51	25	15	31	9	4	10	6	100
52	25	14	24	9	≤5	20	6	98+
53	27	10	18	9	≤4	15	10	89+

Unpublished Records
Subject to Revision

Hydrologic Laboratory
Lakewood, Colorado

Mineralogy of samples 76UT4-9 and 76UT10-21

Unpublished Records
Subject to Revision

ratory ple ber	Quartz	Potassium Feldspar	Plagioclase Feldspar	Calcite	Dolomite	Clay Minerals	Analcime	Total
UT4	9	9	6	9	32	10	1	76
5	9	6	9	10	30	10	2	76
6	13	6	10	16	28	10	1	84
7	13	11	4	17	28	10	1	84
8	9	4	3	4	59	10	4	93
9 S-11	52	7	6	9	7	15	1	97
UT10 S-1	38	7	7	14	10	15	1	92
11 S-5	19	4	5	14	21	15	1	79
12	40	8	9	11	12	20	2	102
13 S-7	37	7	8	12	14	15	1	9
14 S-2	31	6	8	13	15	15	2	
15 S-3	56	8	6	8	6	10	1	
16 S-4	36	6	7	10	12	15	2	
17 S-9	24	16	11	8	4	15	8	
18 S-13	24	12	19	9	<5	10	9	
19 S-10	27	12	25	12	6	10	5	
20 S-12	26	11	22	10	4	10	5	
21 S-11	54	9	7	8	8	10	2	

OPTIONAL FORM NO. 10
JULY 1973 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

: Dan Finn, WRD
Salt Lake City, Utah

DATE: November 19, 1975

: F. S. Riley, WRD, Stop 404
Lakewood, Colorado

ECT: PROGRAMS AND PLANS--Transmittal of data for samples 75UT21-53 and 76UT10-21

Attached are particle-size distribution graphs and a statistical characteristics table summarizing results for the samples listed above. Similar site numbers listed for the 75 Utah samples and 76UT10, 11, 13, and 14 were plotted on the same graph. *

Bulk X-ray determinations for all samples will be mailed on November 21.

Francis S. Riley

Chief, Hydrologic Laboratory

Attachments

cc: District Chief

* For all samples the fine gravel sizes (if all present) have been saved separately for additional studies of shape factors, color, and lithology.

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

Unpublished Records
Subject to Revision

Hydrologic Laboratory
Lakewood, Colorado

Statistical characteristics of grain-size analyses for samples 75UT21-53

Laboratory sample number	Median size (mm)	Sorting coefficient	Skewness	Kurtosis	Uniformity coefficient
75UT21	.27	2.1	1.3	$5.2X10^{-2}$	4.6
22	.44	3.1	2.0	.11	7.9
23	2.3	3.7	.50	.26	40.
24	1.1	4.8	.86	.20	21.
25	.42	4.9	2.1	--	--
26	2.0	2.7	.80	.21	44.
27	.12	4.1	5.1	--	--
28	1.9	2.5	1.0	.17	8.5
29	3.3	4.2	.38	.24	67.
30	2.2	3.6	.41	.28	62.
31	2.3	4.1	.59	.23	37.
32	2.4	2.8	.83	.23	12.
33	6.9	5.2	.28	.32	52.
34	.53	5.3	5.7	.18	10.
35	1.6	9.9	1.2	.20	62.
36	.40	5.0	6.7	.19	4.5
37	2.1	5.4	.34	.23	54.
38	2.1	6.1	.32	--	--
39	2.3	3.6	.48	.26	24.
40	.87	5.1	1.2	.24	27.

Unpublished Records
Subject to Revision

istical characteristics - 75UT21-53 (concluded)

Unpublished Records
Subject to Revision

boratory sample number	Median size (mm)	Sorting coefficient	Skewness	Kurtosis	Uniformity coefficient
75UT41	.44	5.7	3.0	--	--
42	.31	7.0	3.8	--	--
43	.44	7.2	3.8	--	--
44	2.6	3.8	.71	.25	52.
45	8.6	7.6	$4.8X10^{-2}$	.31	128.
46	.34	1.9	1.1	.15	3.6
47	4.6	1.9	.77	.23	25.
48	.35	3.8	.90	--	--
49	1.8	2.6	.65	.23	16.
50	2.3	3.1	.62	.23	19.
51	1.9	3.4	.49	.28	19.
52	1.8	3.6	.62	.23	20.
53	3.1	5.0	.26	.27	61.

Unpublished Records
Subject to Revision

Median = d_{50}

Sorting coefficient = $\sqrt{\frac{Q_3}{Q_1}}$

Skewness = $\frac{Q_1 \ Q_3}{[\text{Median}]^2}$

Kurtosis = $\frac{Q_3 - Q_1}{2(P_{90}-P_{10})}$

Uniformity coefficient sorting index = $\frac{d_{60}}{d_{10}}$

eturn Report to: USGS, WRD, 125 S. State Rm 80 SLC, UT 84138

ıtest Date esults needed: 6-30-25

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use)

and No. 4649-00100

Sample No's: (Lab.use)

Page 1 of 3 pages

Labora-tory Sample No. (Lab.use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field No. (if any)	Location SW Site #	Location Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permea-bility	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
5UT21	SC	1 # of cartons		1	09306400	11-13-74	Stream Bed Sample					
22		2		2	09306400	1-7-75						
23		2		3	09306405	11-13-74						
24		2		4	09306405	1-7-75						
25		1		5	09306415	11-14-74						
26		1		6	09306417	1-21-75						
27		2		7	09306420	11-14-74						
28		1		8	09306420	1-8-75						
29		2		9	09306425	11-14-74						
30		1		10	09306425	1-8-75						
31		2		11	09306430	11-12-74						
32		2		12	09306438	1-9-75						
33		1		13	09306500	11-12-74						

Other: < 2 mm dia. — Mineral Id by X-ray diff. + clay Mineral Id.
> 2 mm dia. — Lithologic Description

1/ Sample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
2/ Sp. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
3/ Other analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits; PL = Plastic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension; pH; GC = Gypsum content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility; SC = Soil conductivity; HM = Heavy mineral; FF = Formation factor.

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GPO 888000

Date: 4-30-75

Return Report to: USGS, WRD, 125 S. State, Rm 8002, SLC, UT 84138

Latest Date results needed: 6-30-75

HYDROLOGIC LABORATORY

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use)

Name and No. 4649-100

Sample No's: (Lab.use)

Page 2 of 3 pages

Laboratory Sample No. (Lab.use)	Sample type 1/	Depth, ft. ~~From~~ # of cartons	Depth, ft. To	Field No. (if any)	Location SW Site #	Location Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permeability	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
75UT34	SC	2		14	09306500	1-6-75	Stream Bed Sample					
35		1		15	09306600	11-14-74						
36		2		16	09306600	1-8-75						
37		2		17	09306605	11-14-74						
38		2		18	09306605	1-6-75						
39		1		19	09306610	11-14-74						
40		2		20	09306610	1-9-75						
41		1		21	09306620	11-13-74						
42		2		22	09306620	1-6-75						
43		2		23	09306625	11-13-74						
44		1		24	09306625	1-6-75						
45		1		25	09306700	11-13-74						
46		1		26	09306700	1-7-75						

Other: <2mm dia. — Mineral Id by X-ray + Clay Mineral Id.

1/ Sample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
2/ Sp. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
3/ Other analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits; PL = Plastic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension; pH; GC = Gypsum content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility; SC = Soil [illegible] = Heavy mineral; FF = Formation factor

Forward copies 1-3 to [illegible]
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GPO 8880

Date: 4-30-75

Return Report to: SGS, WRD, 125 S. State, Rm 8002, SLC, UT 84138

Latest Date results needed: 6-30-75

HYDROLOGIC LABORATORY

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use)

and No. 4649-00

Sample No's: (Lab.use)

Page 3 of 3 pages

Laboratory Sample No. (Lab.use)	Sample type 1/	Depth, ft. ~~From~~ # of Cartons	Depth, ft. To	Field No. (if any)	Location	Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permeability	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
75UT47	SC	1		27	(D-10-25) 7c	1-14-75	Stream Bed Sample					
48	SC	1		28	(D-10-25) 7b	1-14-75						
49	SC	1		29	(D-10-24) 11a	1-14-75						
50	SC	1		30	(D-10-24) 14ab	1-14-75						
51	SC	1		31	(D-10-24) 14bb	1-14-75						
52	SC	1		32	(D-10-24) 15b	1-8-75						
53	SC	1		33	(D-10-24) 18d	1-14-75						
					Above 7 samples are from							
					tributary channels to White River							

Other: <2mm dia. - Mineral Id. by X-ray + Clay Mineral Id.; >2mm dia. - Lithologic Description

1/ Sample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
2/ Sp. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
3/ Other analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits; PL = Plastic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension; pH; CC = Carbonate content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility; [illegible] = Heavy mineral; FF = Formation factor.

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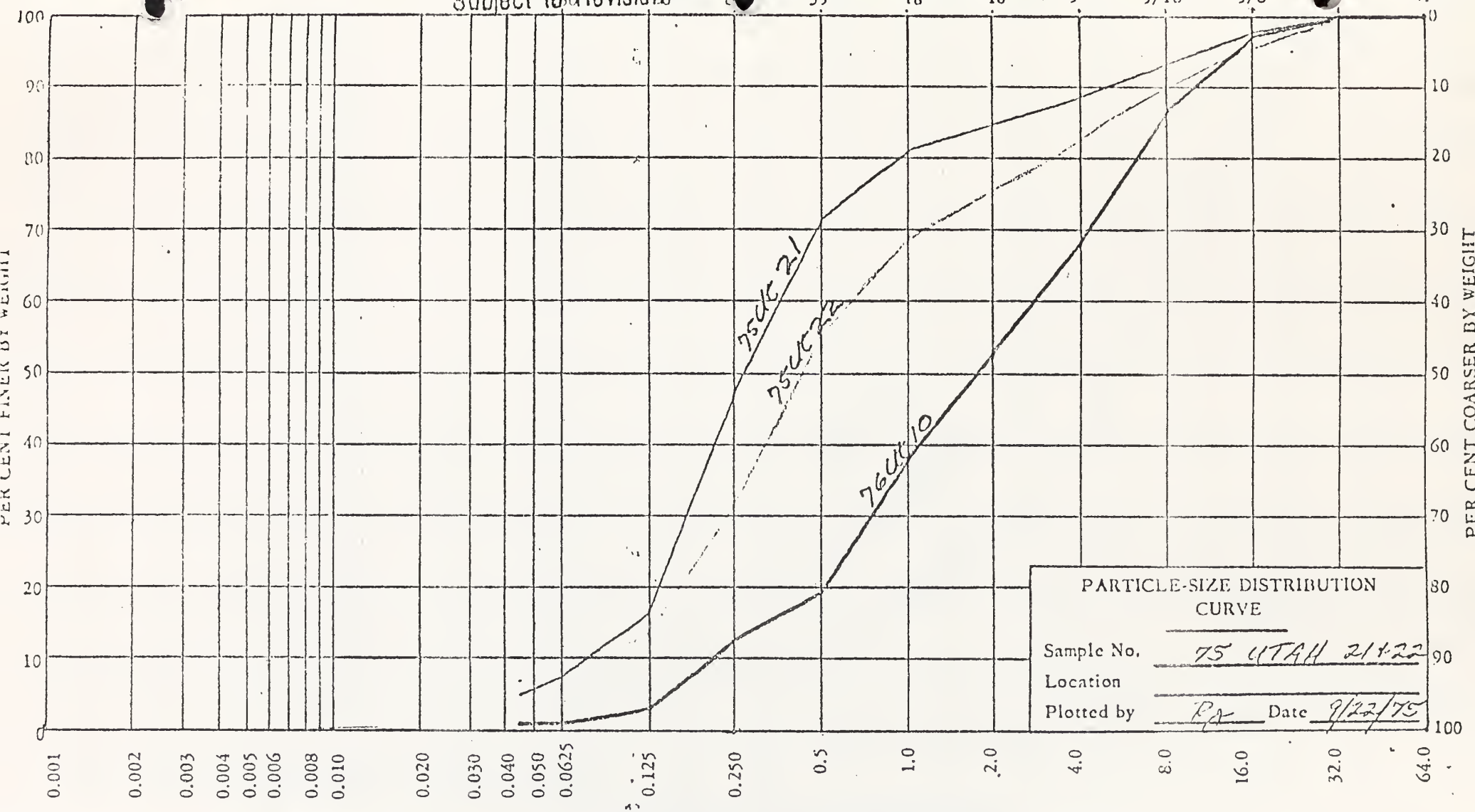
GPO 855000

HYDROMETER

Unpublished Records
Subject to Revision

U. S. STANDARD SIEVE NUMBER OR SIZE OPENING

100 35 18 10 5 5/16" 5/8" 2½"



PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. 75 UTAH 21+22

Location

Plotted by RA Date 9/22/75

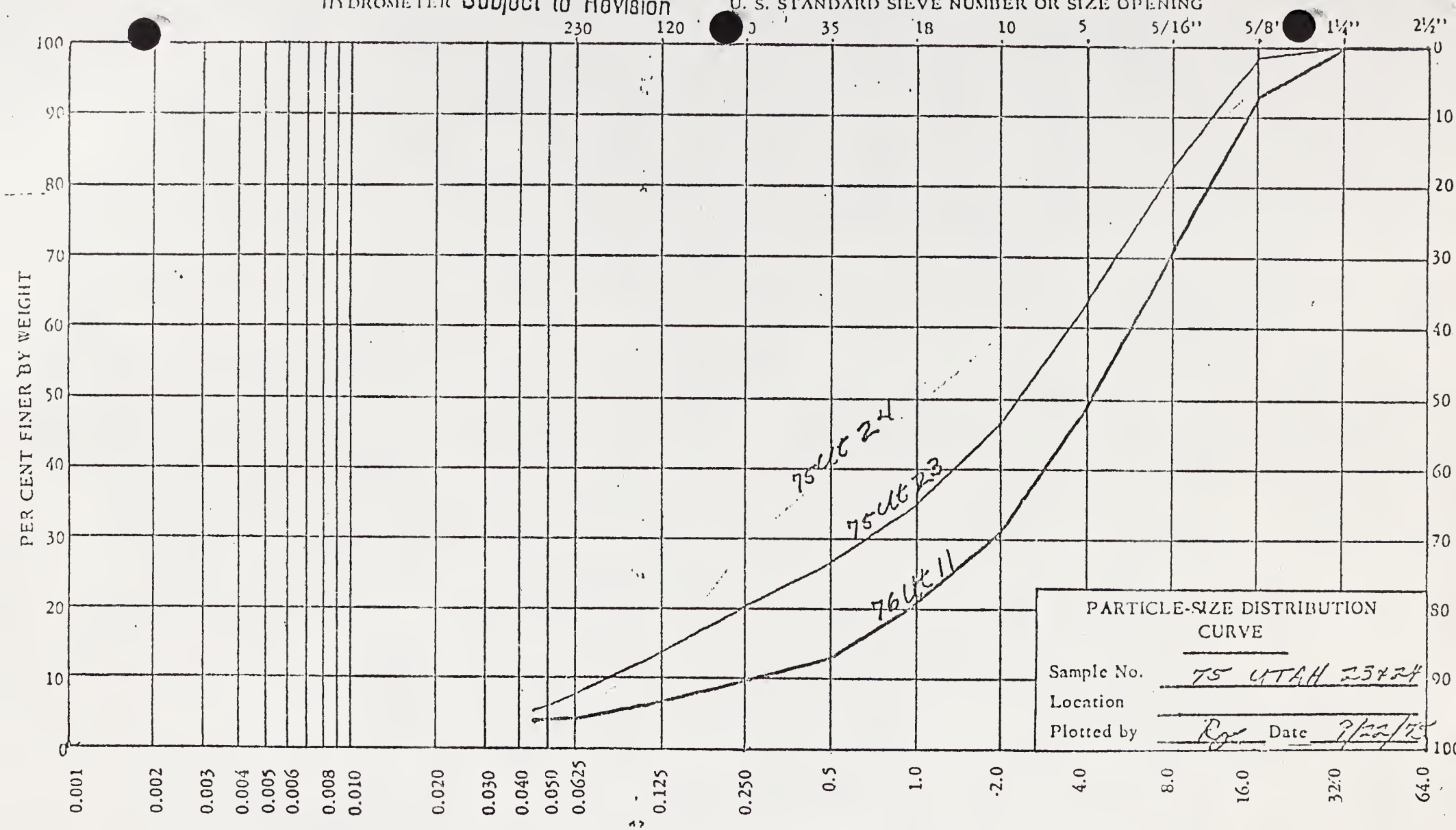
0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#21	7.1		9.6	31.2	24.2	10.0	3.7	3.8	4.7	4.5	2.1	0
#22	8.1		4.5	18.4	23.5	13.9	7.0	7.3	7.6	5.3	4.4	0
#10	.6		1.8	9.7	6.6	18.8	15.4	15.3	13.4	10.6	2.7	0

#21 Red
#22 Blue

GPO 940268



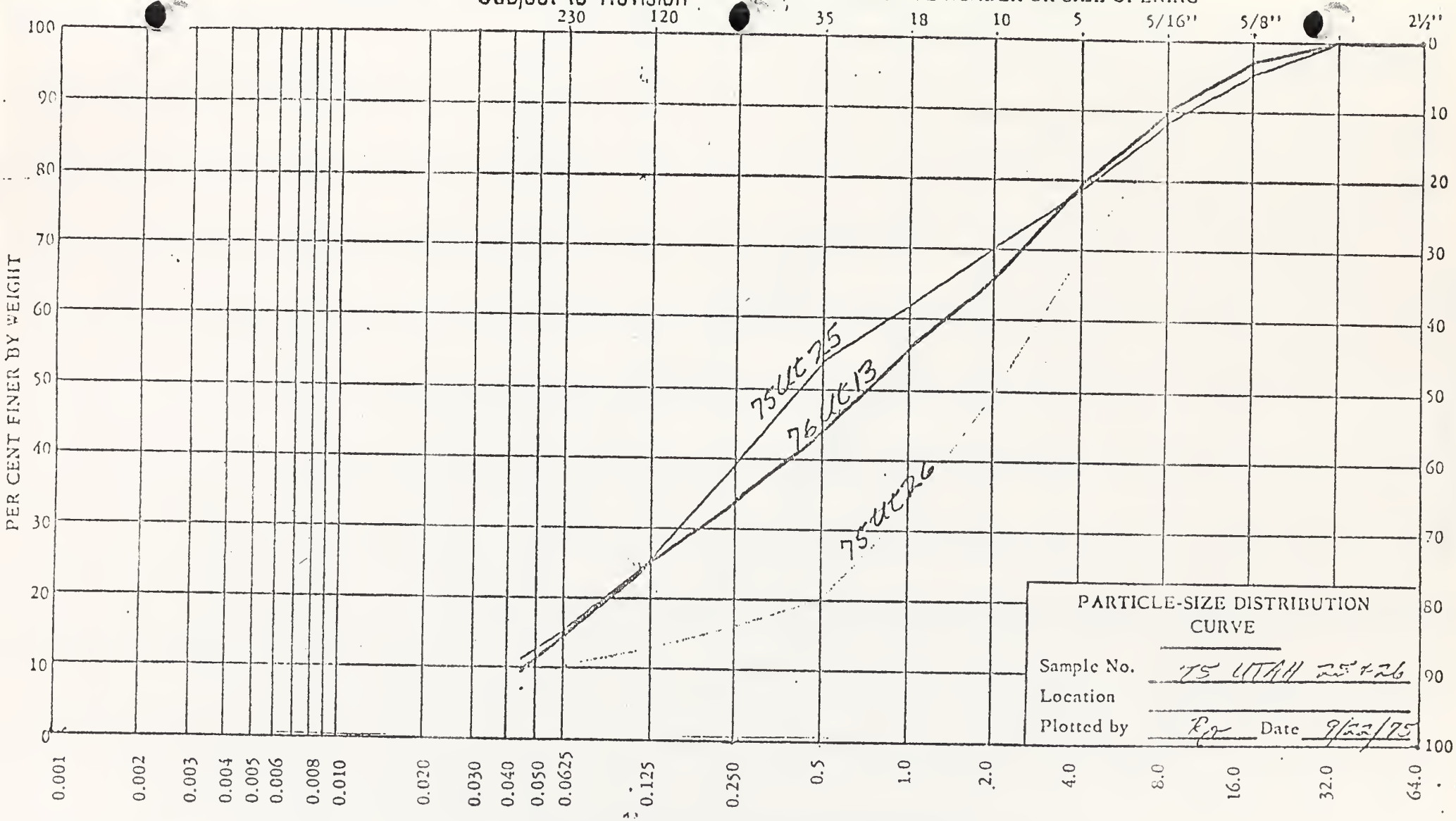
% OF SIZE

CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#23	7.3	5.9	6.9	6.2	8.2	12.0	17.3	18.9	15.7	1.6	0
#24	4.6	8.2	16.0	10.4	9.4	10.4	12.3	12.8	10.2	5.4	0
#11	3.8	2.5	3.0	3.2	8.0	10.5	12.8	22.2	21.9	7.1	0

#23 Red
— #24 Blue

GP 40288

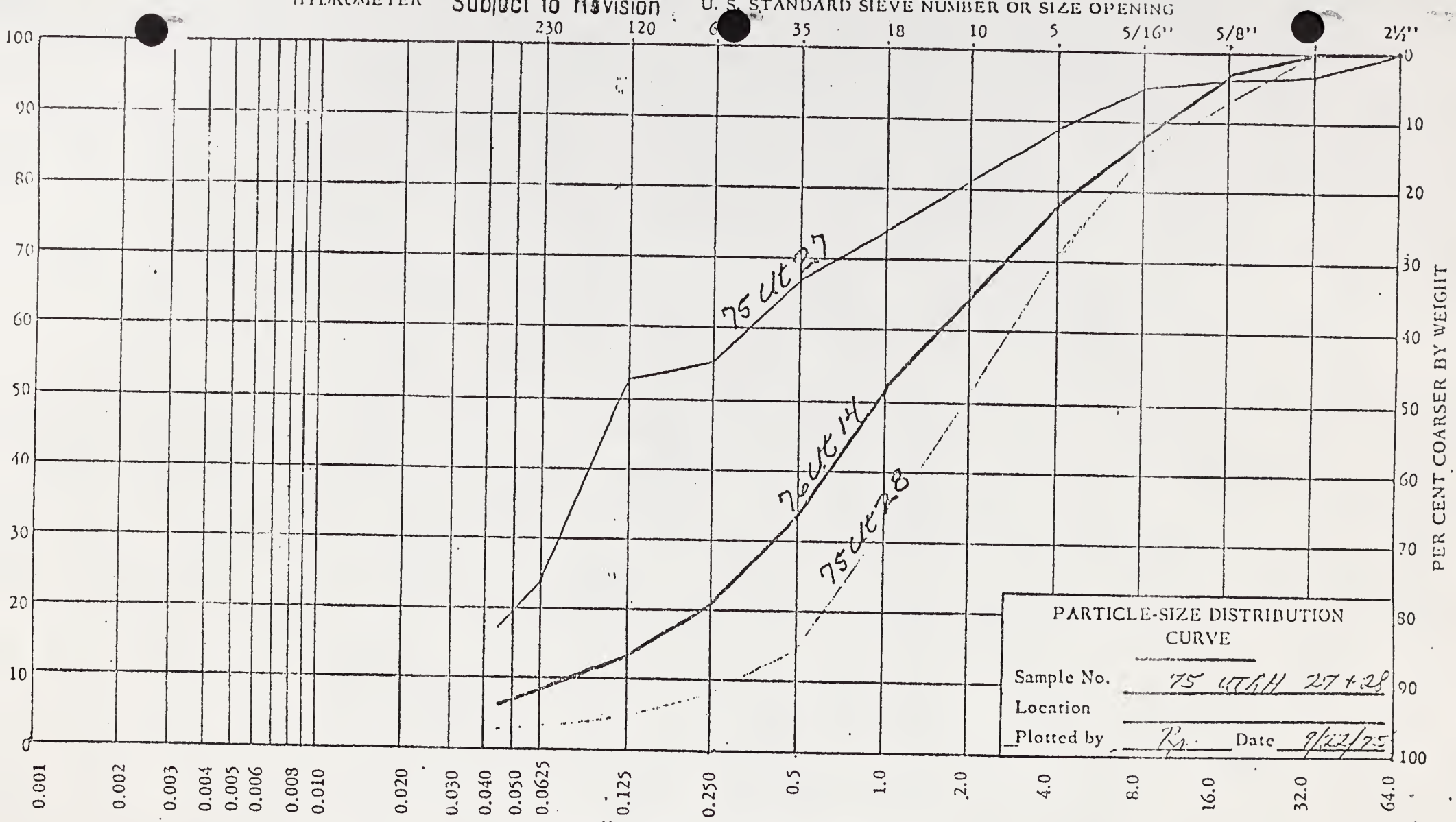
HYDROMETER Subject to Revision U. S. STANDARD SIEVE NUMBER OR SIZE OPENING



% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#25		14.9	10.0	13.9	14.7	8.2	8.6	8.3	9.7	7.1	4.6	0
#26		9.9	2.5	3.2	4.1	12.8	17.0	20.4	16.1	10.0	3.9	0
#13		14.1	10.4	8.9	10.0	12.0	10.6	13.3	10.6	7.2	2.8	0

#25 Red
#26 Blue

GI 840288



PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. 75 UTGH 27+28

Location

Plotted by Rp Date 9/22/75

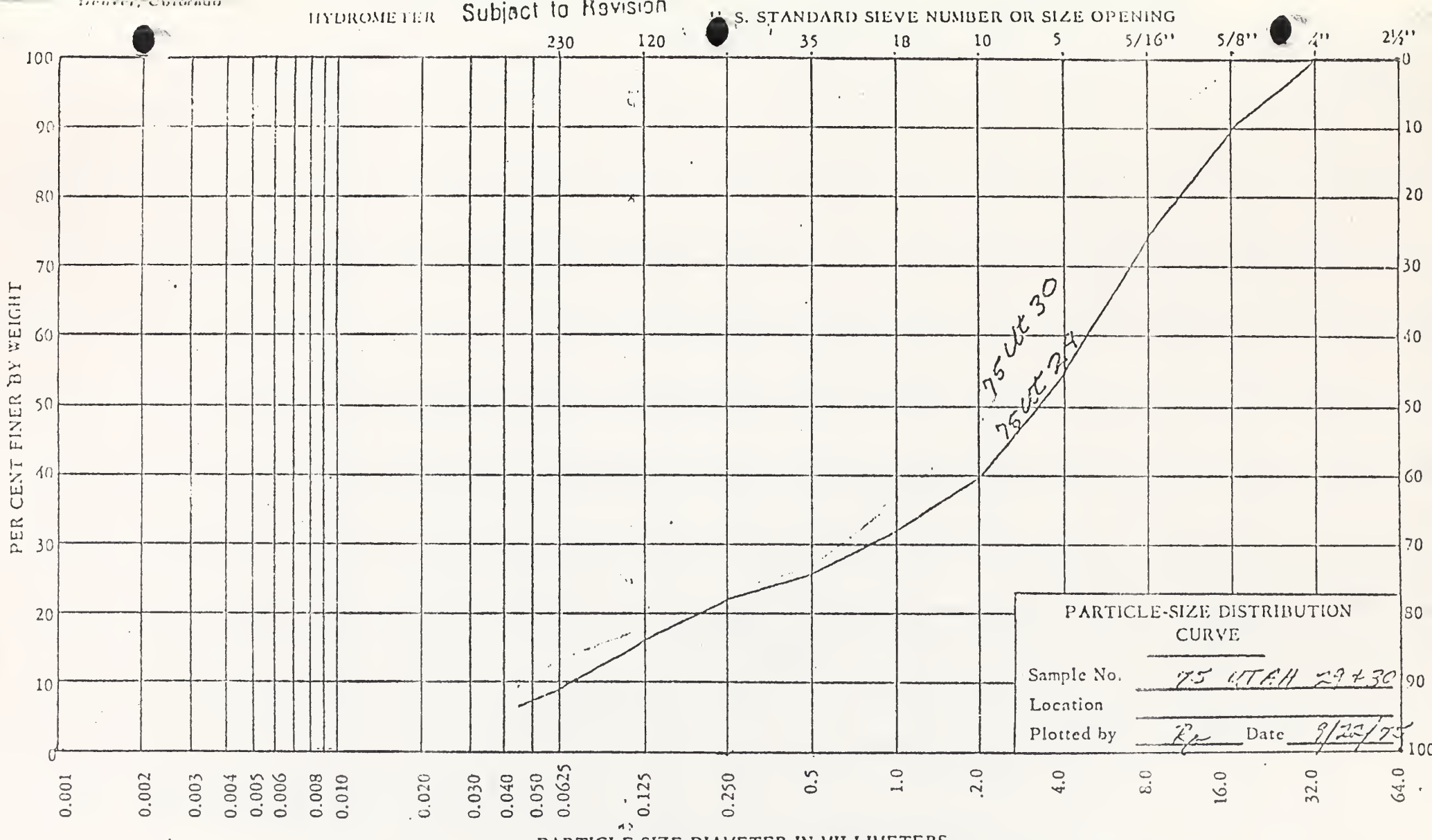
CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#27	23.6 ~~16.7~~	28.8	2.4	11.9	7.2	7.6	7.6	5.8	1.3	0.4	3.3
#28	2.8	1.4	3.5	6.4	17.9	19.2	19.7	14.6	7.6	7.0	0
#14	8.3	4.8	7.7	12.7	18.4	13.2	13.0	9.9	9.1	9.9	

#27 Red

#28 Blue

GP 40208

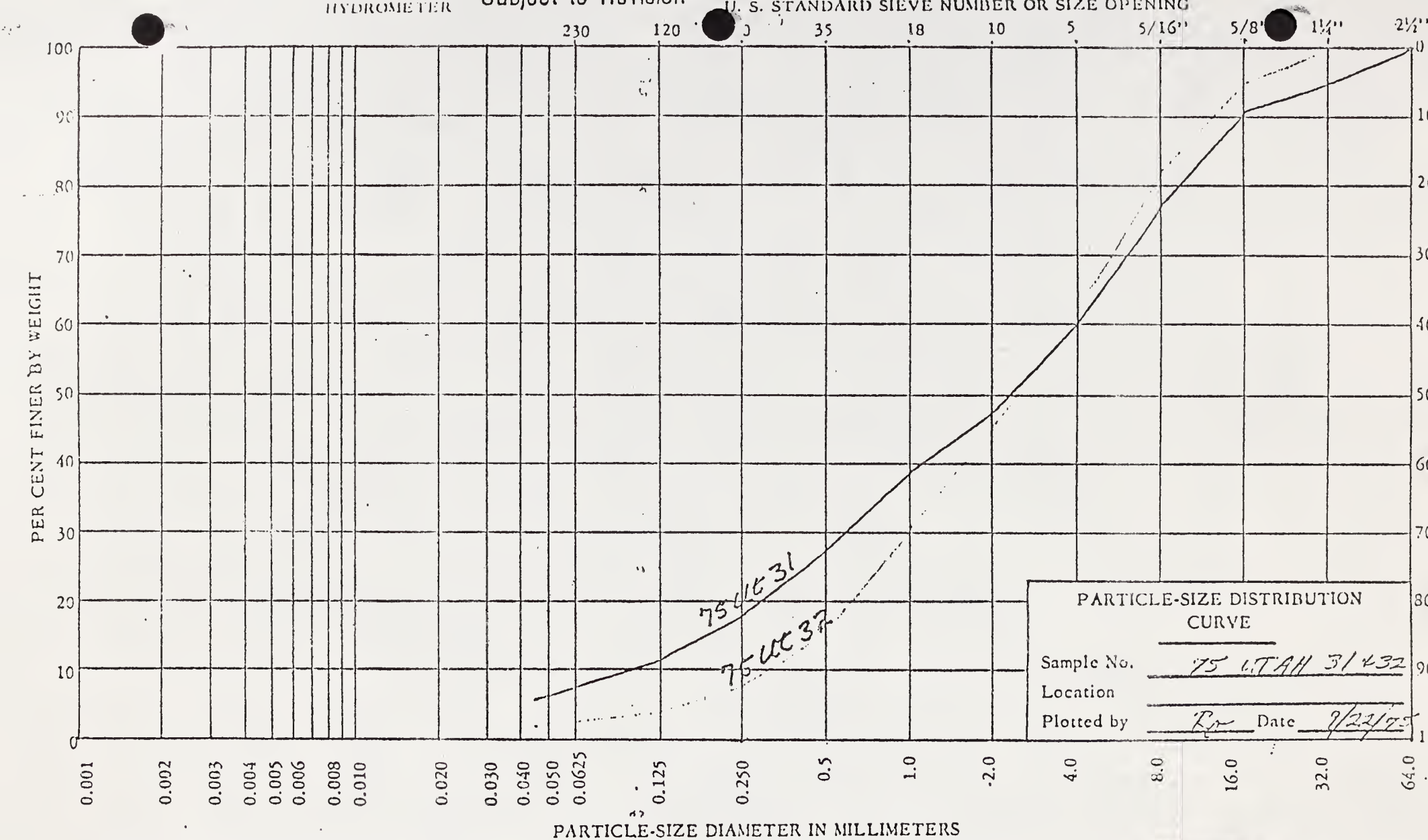
Subject to Revision



% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625..125	Fine .125..25	Medium .25..5	Coarse .5..1	V.Coarse 1..2	GRAVEL SIZES V. fine 2..4	Fine 4..8	Medium 8..16	Coarse 16..32	V.Coarse 32..64
#29	8.5		6.9	6.2	3.6	6.2	7.9	15.3	19.7	15.5	10.3	0
#30	12.7		9.7	5.0	4.0	9.4	11.6	20.4	21.8	9.4	1.0	0

GPO 840259

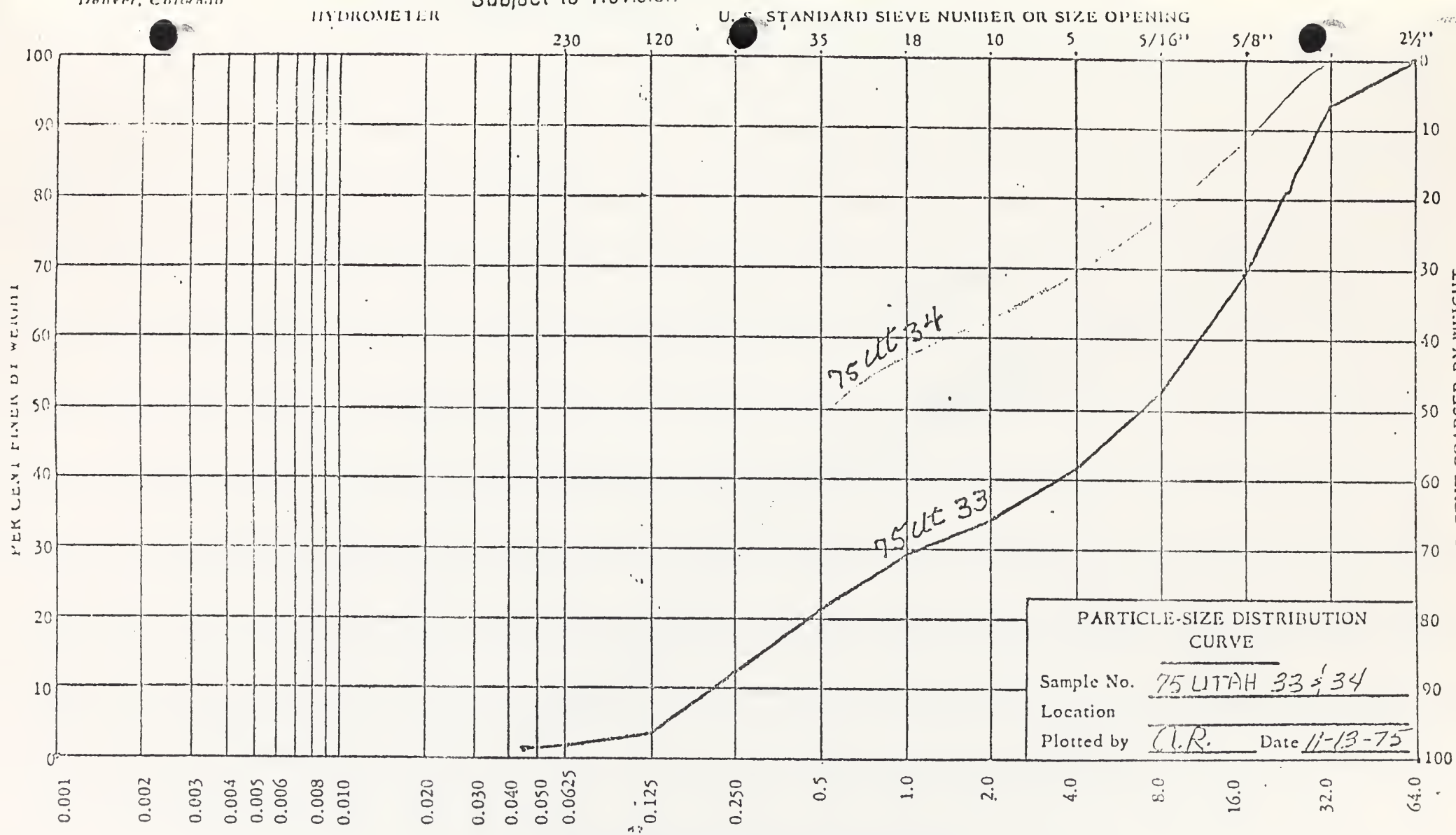
— #29 Red
--- #30 Blue



% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	SAND SIZES Fine .125-.25	SAND SIZES Medium .25-.5	SAND SIZES Coarse .5-1	SAND SIZES V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	GRAVEL SIZES Fine 4-8	GRAVEL SIZES Medium 8-16	GRAVEL SIZES Coarse 16-32	GRAVEL SIZES V.Coarse 32-64
#31	7.1		3.8	6.6	9.6	11.2	9.0	12.9	17.0	13.7	3.9	5.2
#32	2.3		1.2	3.8	7.8	15.0	15.1	16.6	20.3	12.9	5.0	0

GPO 840258

— #31 Red
— #32 Blue



% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#33	1.7		1.8	8.7	9.1	7.7	4.9	2.5	10.9	16.8	24.5	6.5
#34	3.8		4.0	18.6	22.9	8.2	5.2	6.2	7.9	10.6	12.6	0

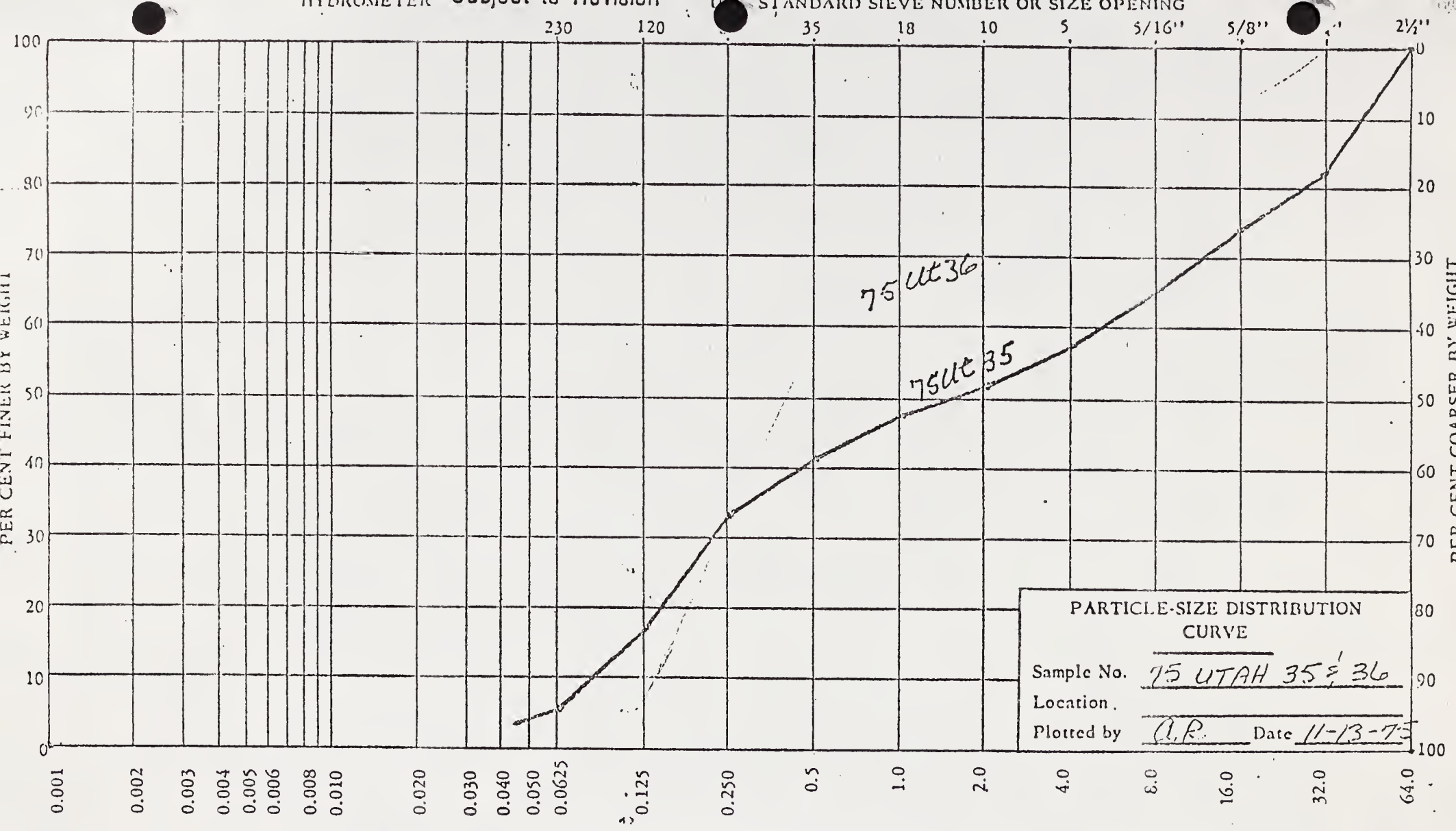
#-33 – #34

GPO 840258

HYDROMETER — Subject to Revision

STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 35 18 10 5 5/16" 5/8" 2½"



PER CENT FINER BY WEIGHT

PER CENT COARSER BY WEIGHT

0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

PARTICLE-SIZE DIAMETER IN MILLIMETERS

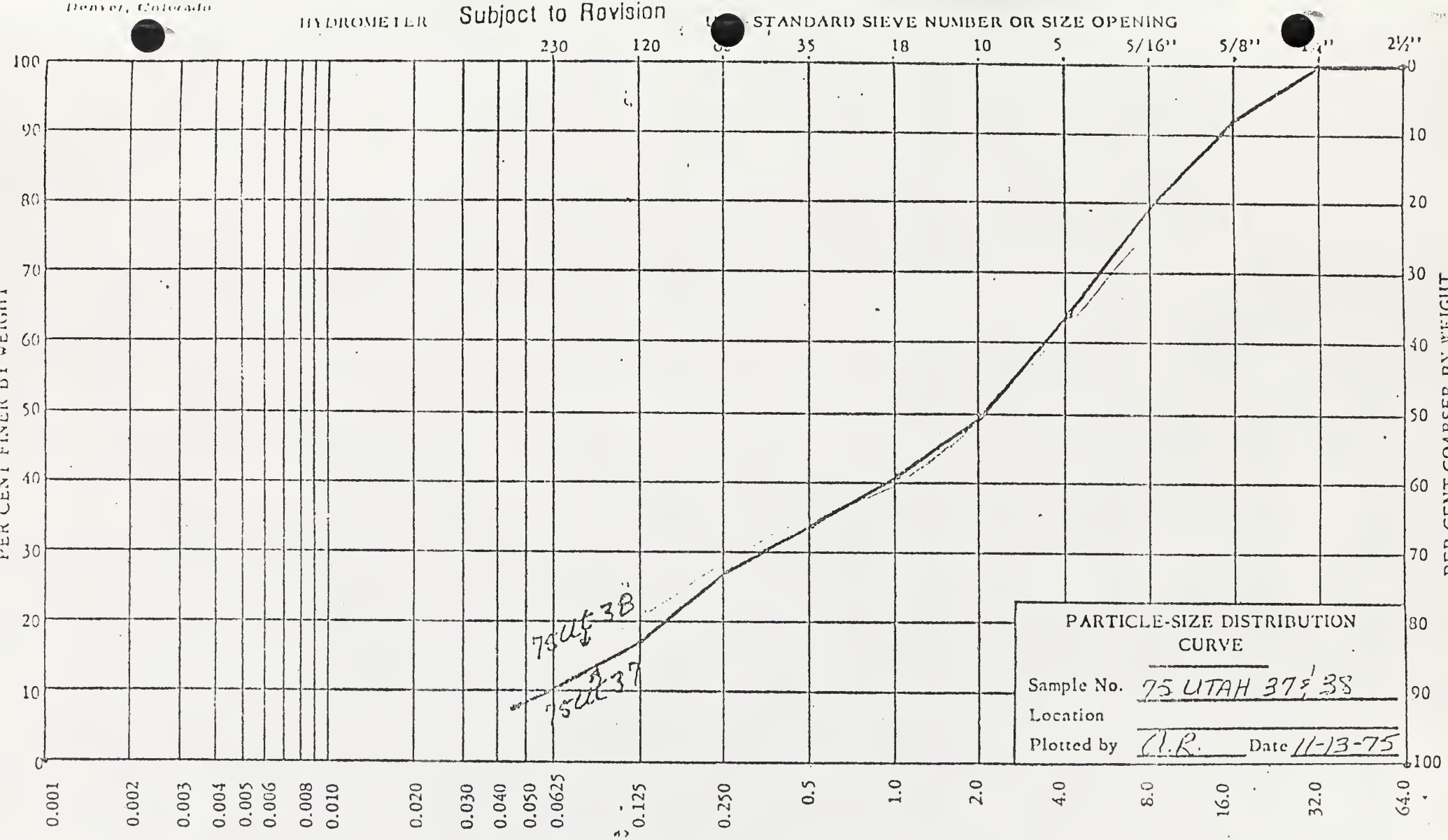
% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#35	53		11.0	16.5	8.1	6.2	4.2	5.7	7.8	8.9	8.1	18.1
#36	18		4.4	25.9	26.3	5.3	3.4	5.2	7.4	14.3	6.1	0

#35 —
#36 ·

GPO 840258

Denver, Colorado

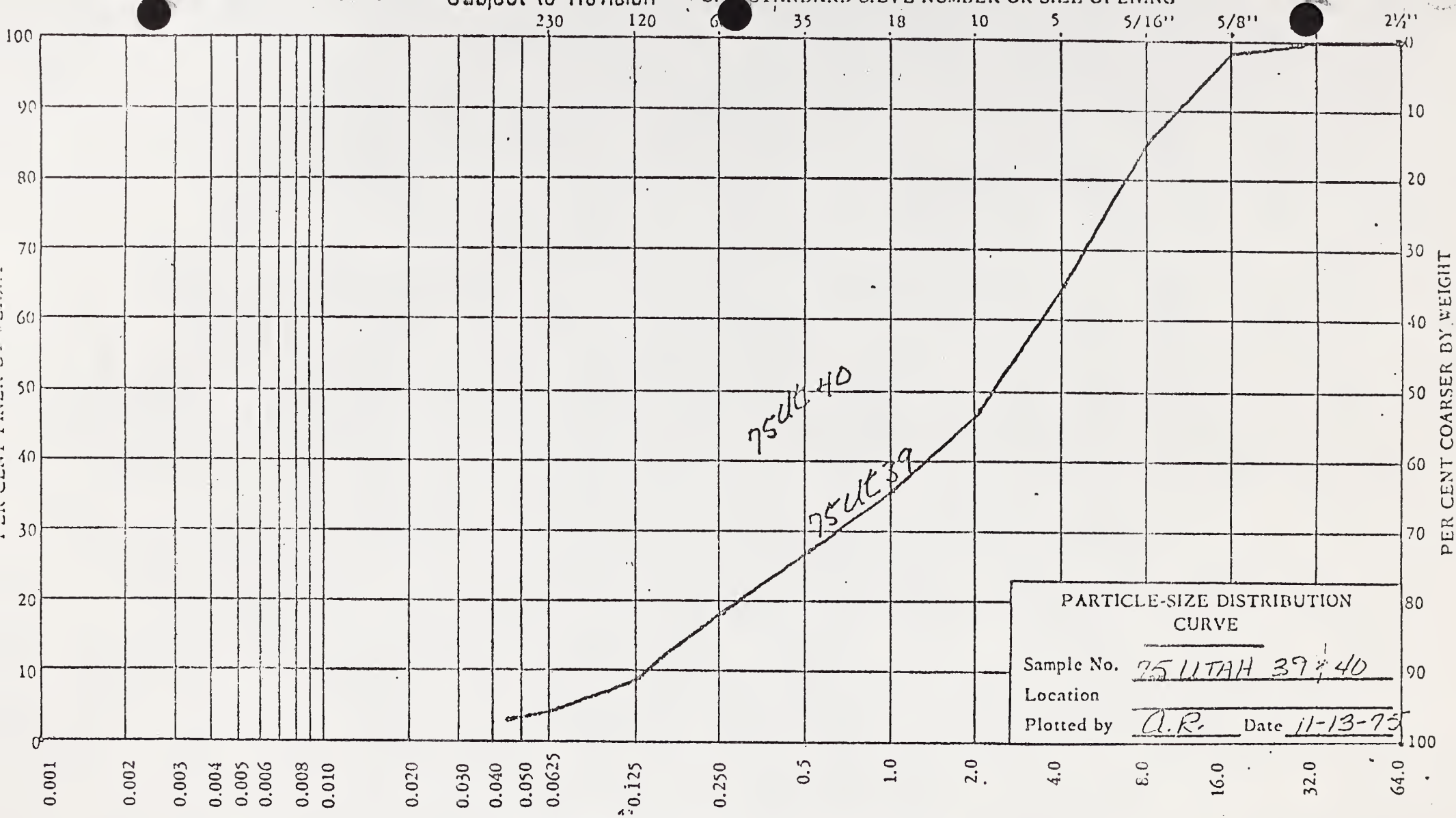
Subject to Revision



% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	GRAVEL SIZES V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#37	10.0		6.7	10.0	6.6	7.0	8.8	14.5	15.8	12.8	7.8	0
#38	13.5		6.1	8.2	6.0	5.5	9.4	13.7	14.3	15.3	8.1	0

#37 —
#38 ·

GPO 840258



PARTICLE-SIZE DIAMETER IN MILLIMETERS

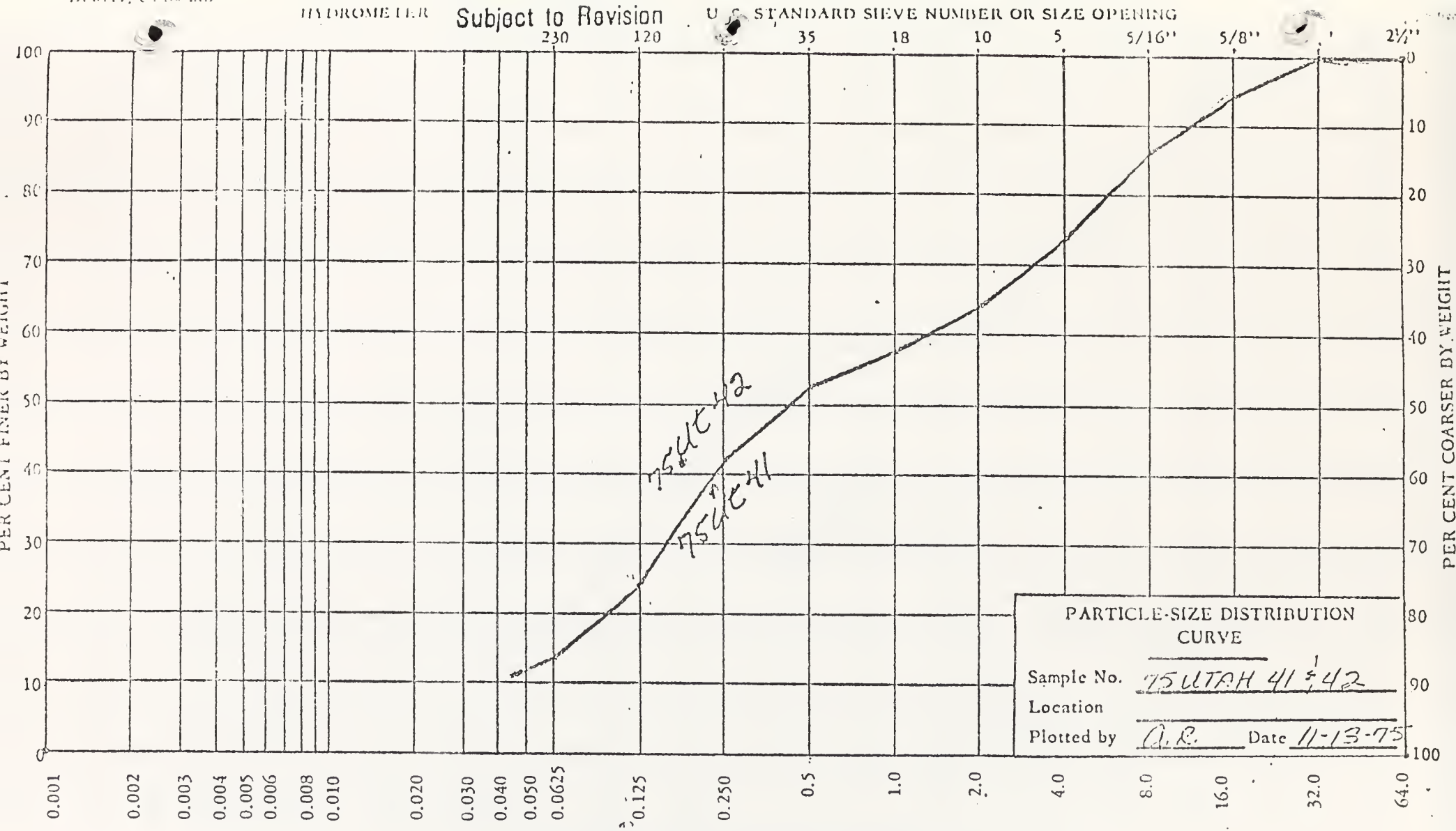
% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625..125	Fine .125..25	Medium .25..5	Coarse .5..1	V.Coarse 1..2	V. fine 2..4	Fine 4..8	Medium 8..16	Coarse 16..32	V.Coarse 32..64
#39	4.0	4.4	9.5	8.6	8.7	11.2	18.3	20.8	13.2	1.4	0
#40	7.0	7.1	19.1	12.5	5.5	7.0	12.3	15.6	13.0	1.1	0

#39 —
#40

GPO 040250

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING



PARTICLE-SIZE DIAMETER IN MILLIMETERS

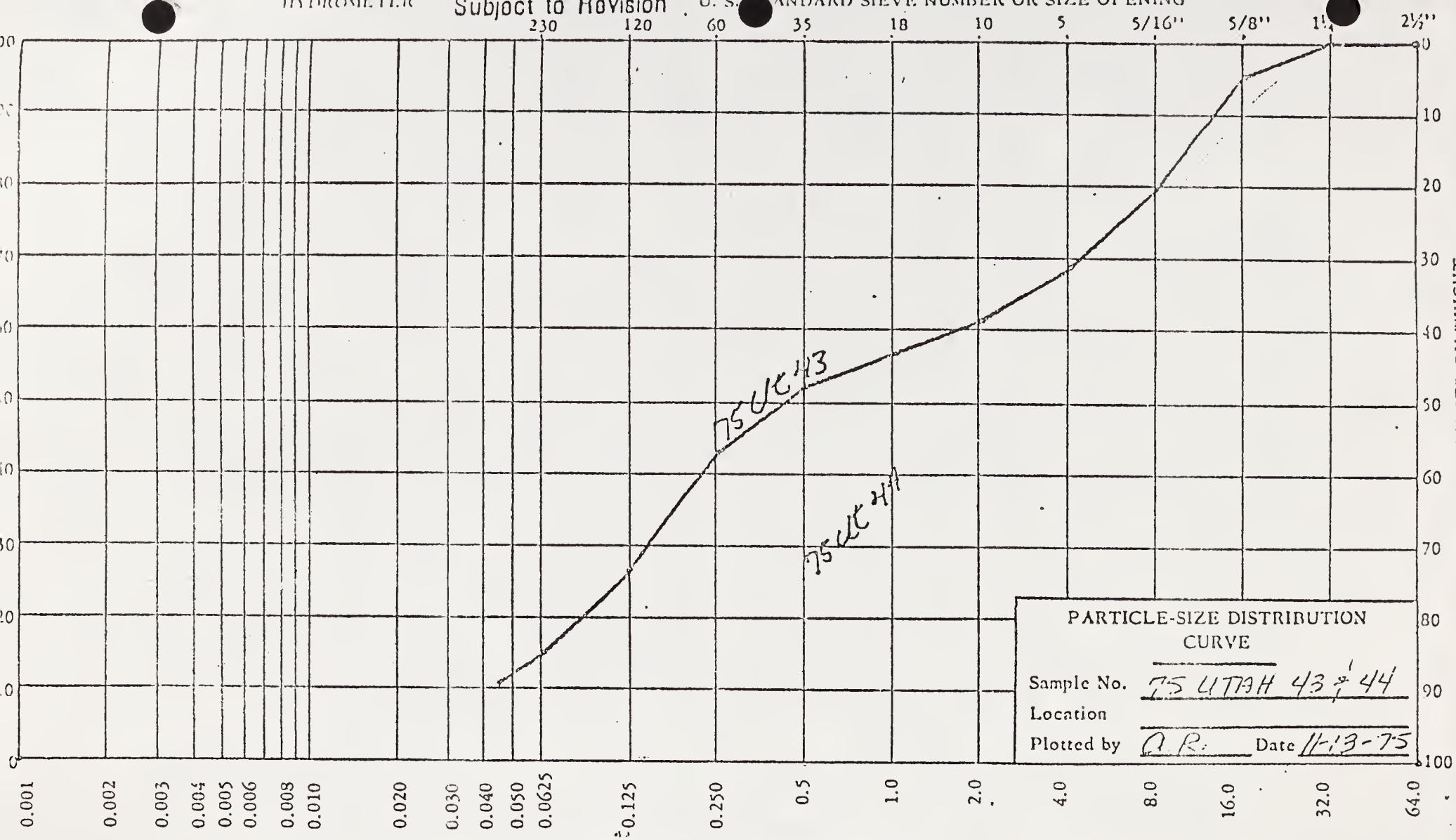
% OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004 – 0.0625 mm	SAND SIZES					GRAVEL SIZES				
			V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#41	13.3		10.2	18.0	10.5	5.1	6.7	9.7	12.4	8.3	5.7	0
#42	18.6		13.0	15.8	7.8	5.0	5.4	8.5	10.0	11.6	4.3	0

#41 —
#42

GPO 840253

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OF OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1" 2½"



PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. 75 UTAH 43 & 44

Location

Plotted by Q.R. Date 11-13-75

PER CENT COARSER BY WEIGHT

0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

PARTICLE-SIZE DIAMETER IN MILLIMETERS

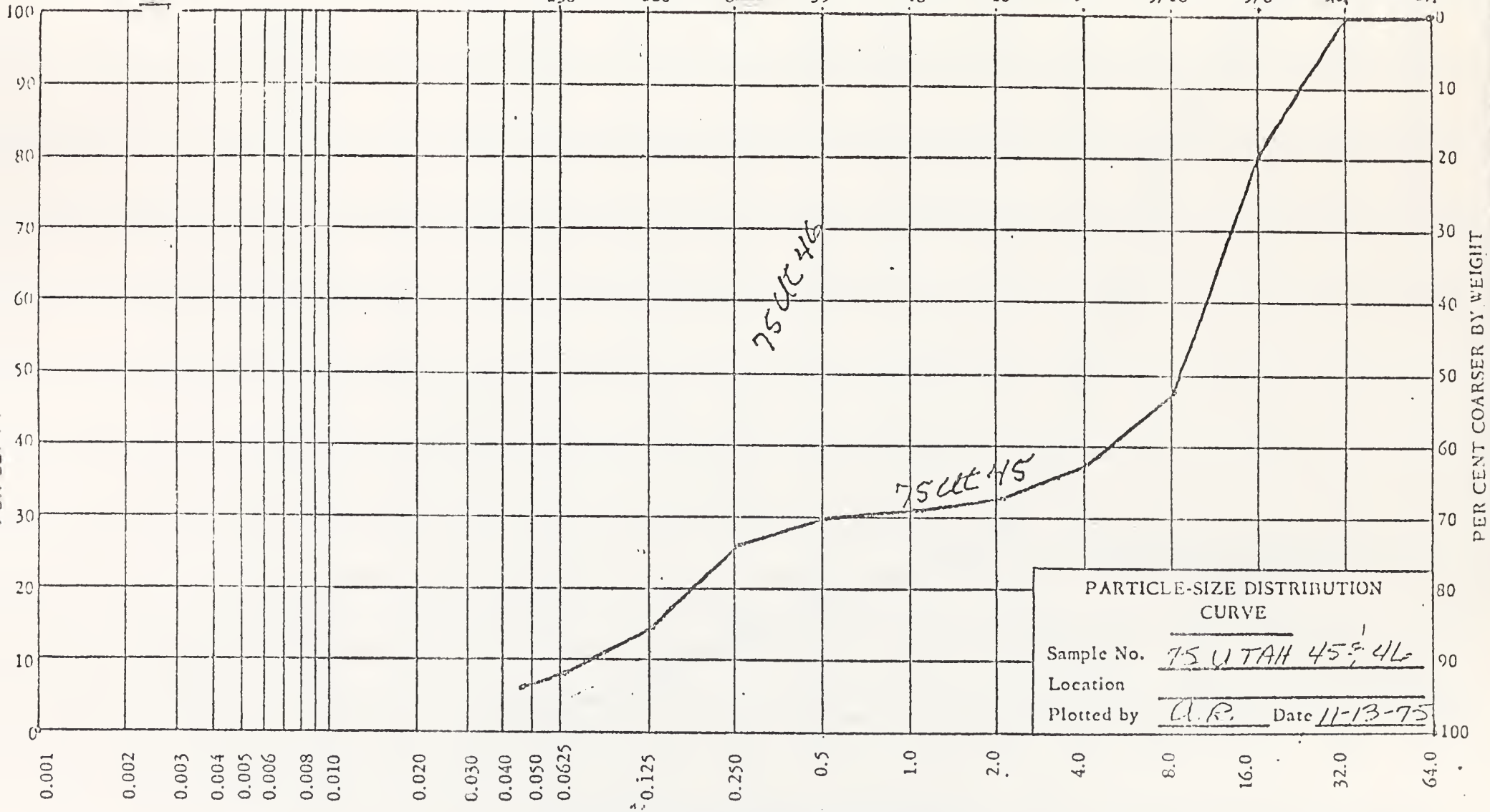
CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#43	14.5	11.4	16.6	9.3	4.6	4.7	7.3	10.9	16.0	4.7	0
#44	8.3	4.4	4.7	5.3	12.5	10.0	13.2	15.7	16.7	9.3	0

#43 →
#44

GPO 840253

HYDROMETER Subject to Revision U. S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1 2½"



% OF SIZE

PER CENT COARSER BY WEIGHT

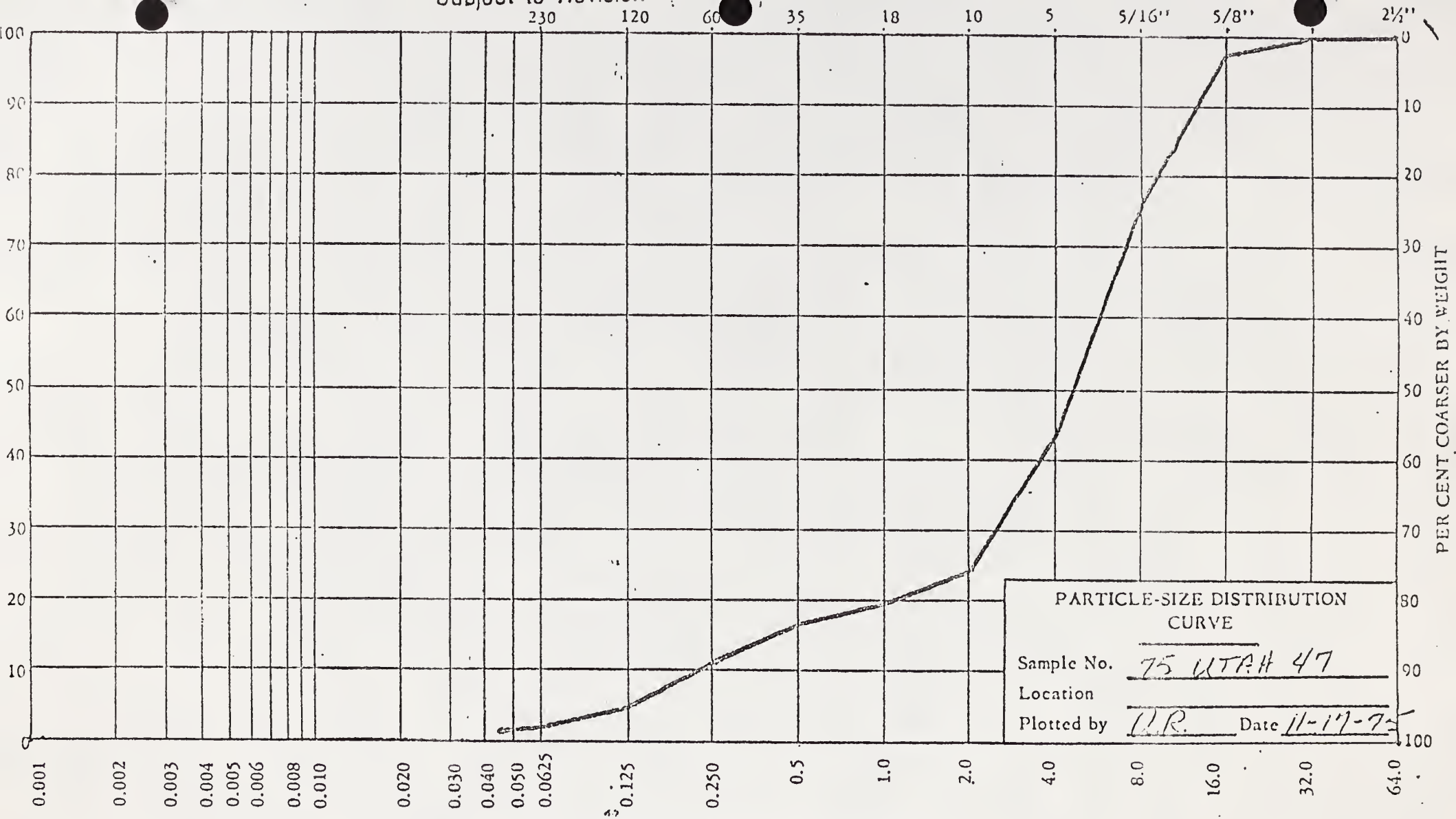
0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

PARTICLE-SIZE DIAMETER IN MILLIMETERS

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
#45 7.5		6.2	11.6	3.7	.89	1.7	4.7	10.0	33.9	19.6	0
#46 4.9		5.5	24.9	32.3	17.3	6.5	4.7	3.0	0.94	0	0

#45 —
#46 ·

GPO 840258



PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V Coarse 32-64
1.6		2.8	6.3	5.4	2.9	4.7	17.6	32.7	21.6	23	0

GPO 840238

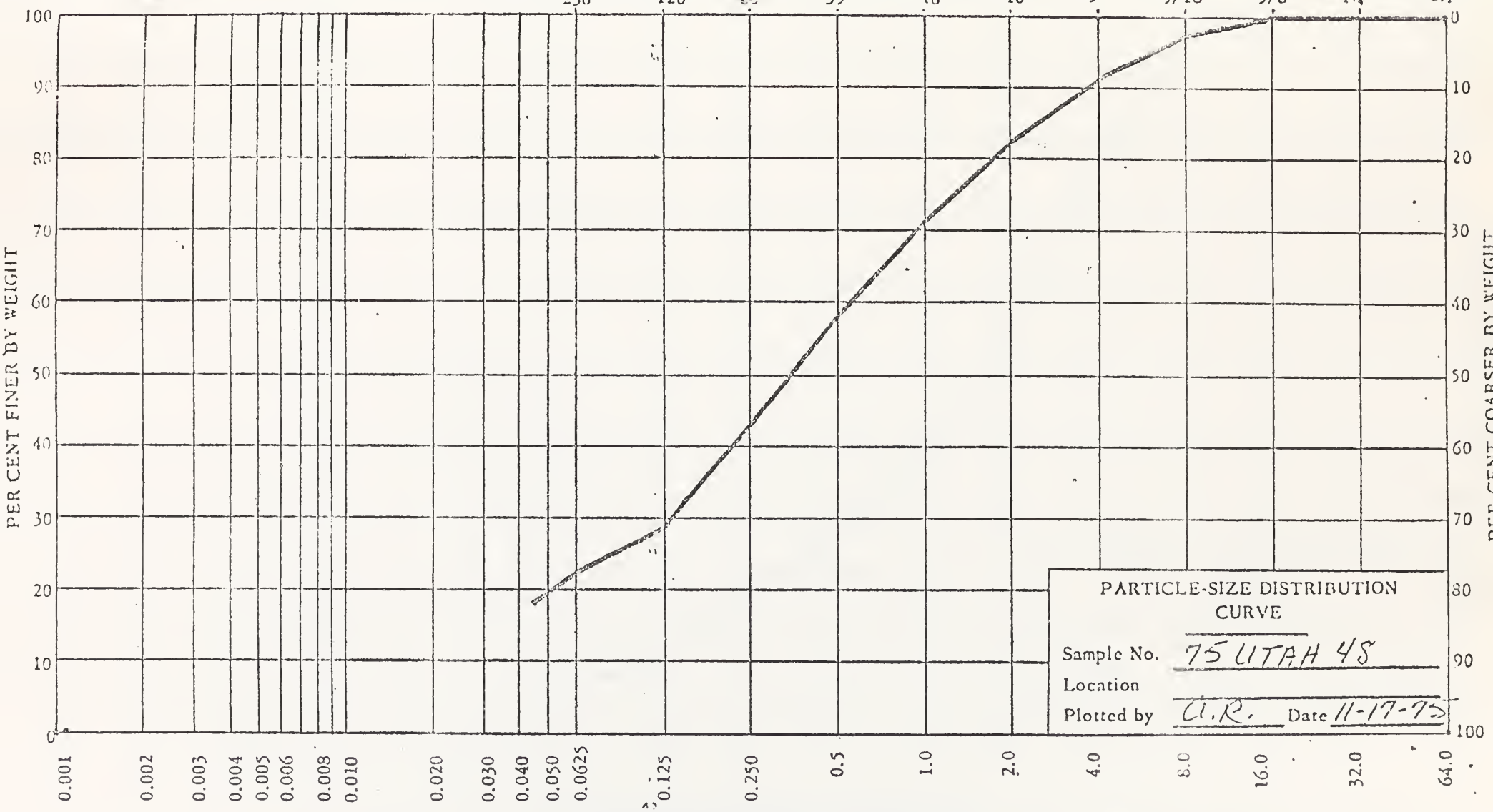
Denver, Colorado

HYDROMETER

Subject to Revision

U.S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1¼" 2½"



PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. 75 UTAH 45

Location

Plotted by C.R. Date 11-17-75

PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
22.0		6.2	14.4	15.2	13.4	11.4	9.0	6.0	2.4	0	0

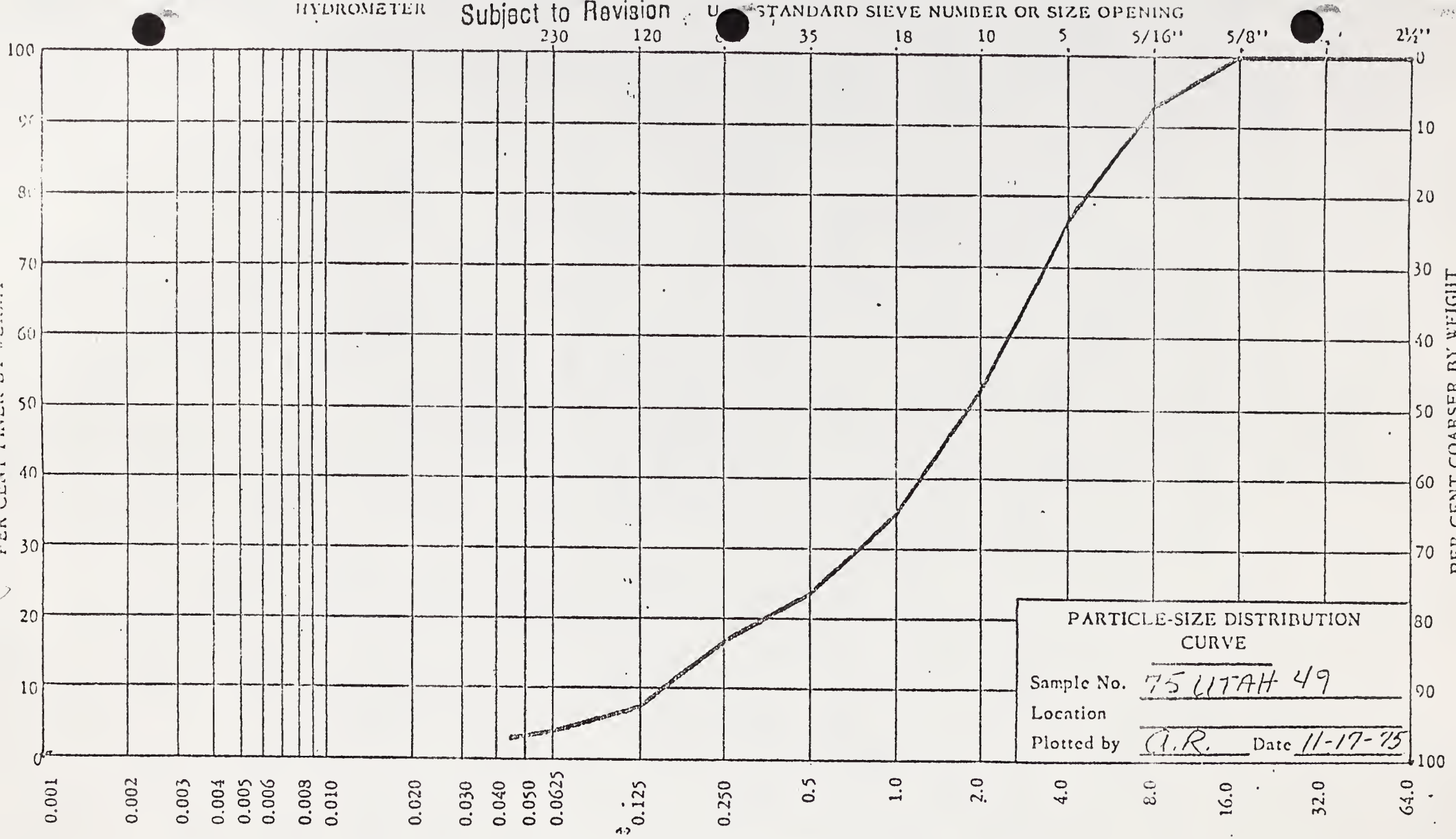
GPO 840258

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 2½"

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT



0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

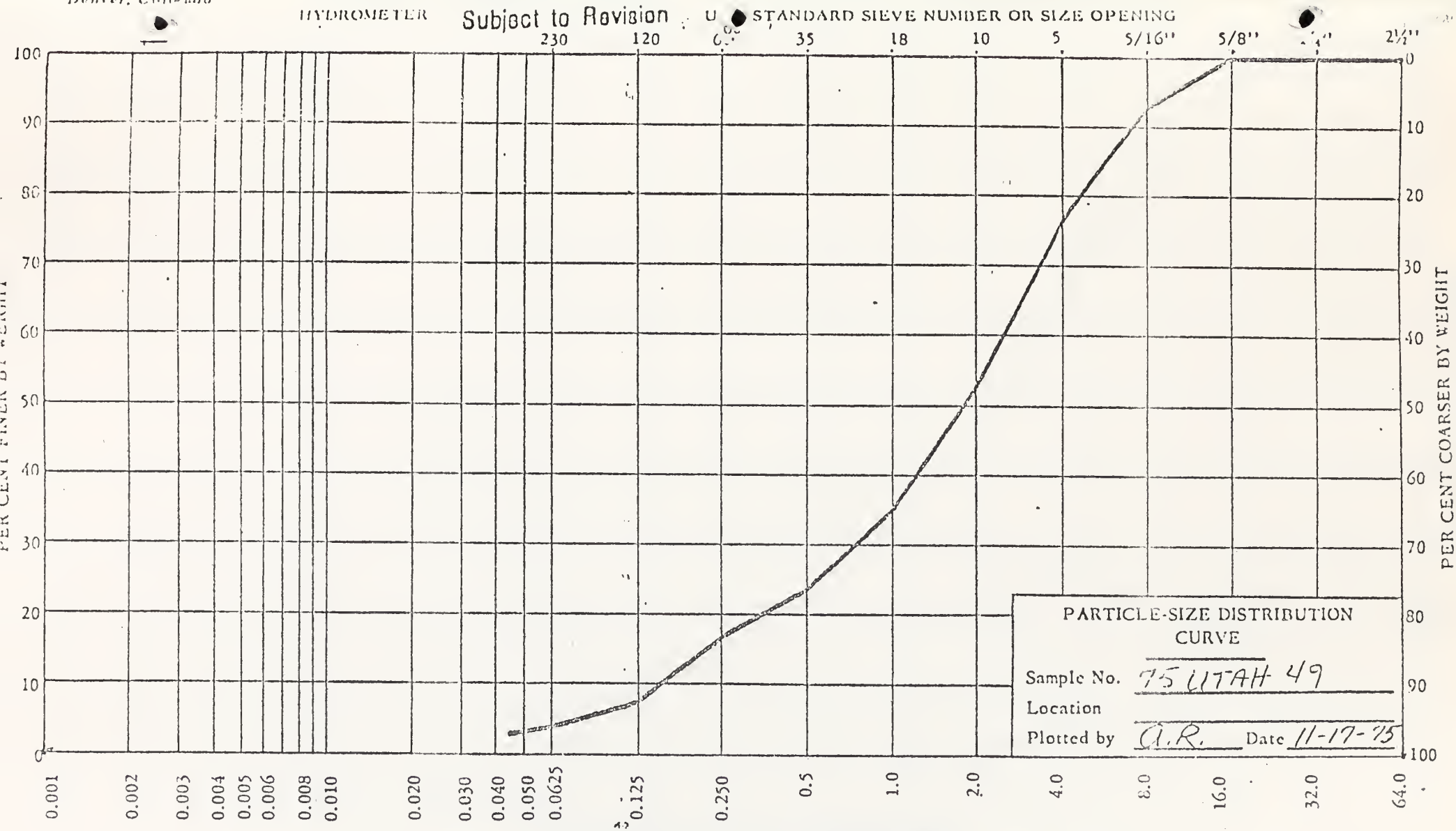
PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
	3.5		3.4	9.3	6.9	11.1	18.3	24.0	16.2	7.2	0	0

GPO 840238

Denver, Colorado

Subject to Revision



PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. 75 UTAH 49

Location

Plotted by C.R. Date 11-17-75

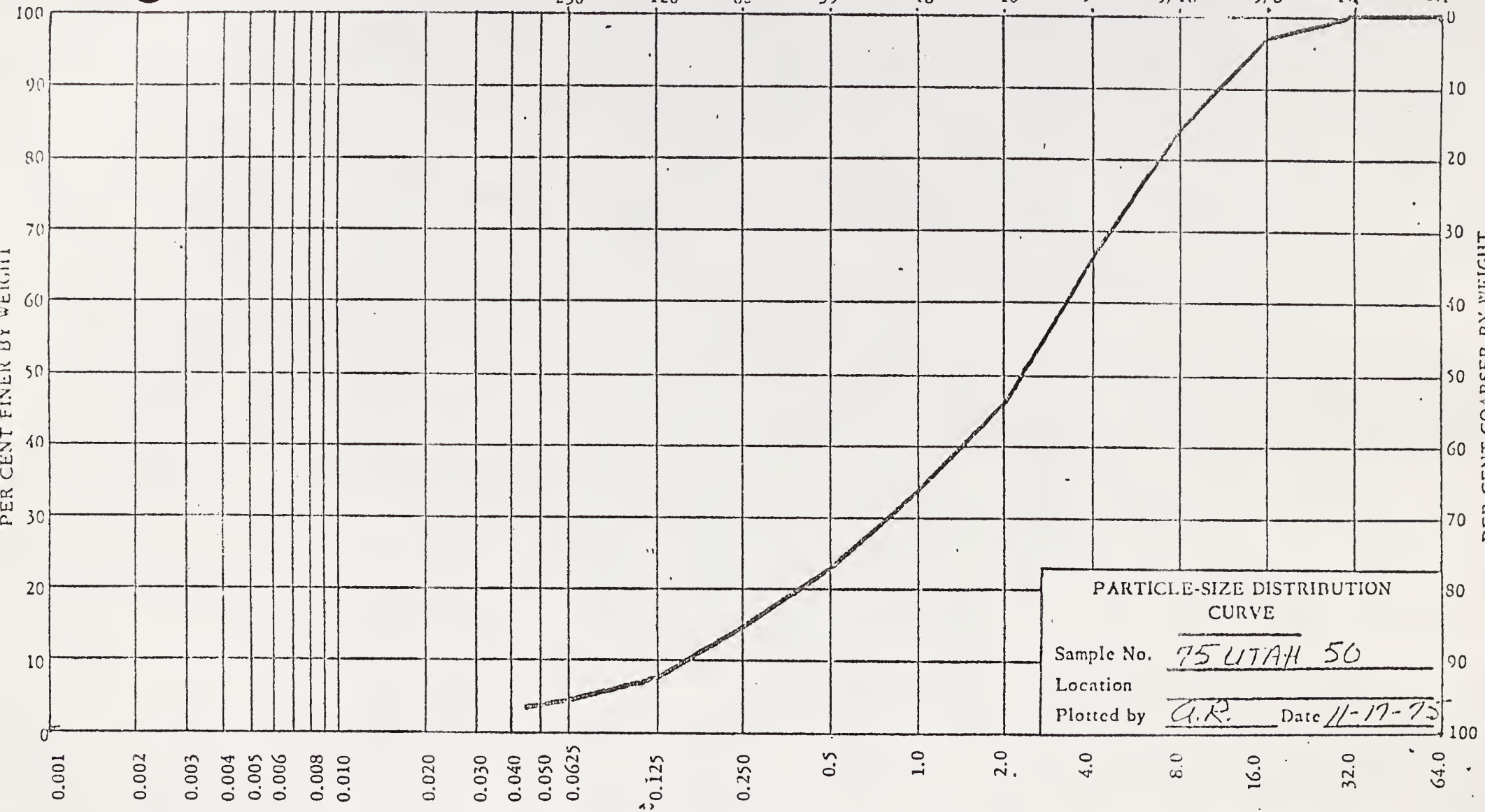
% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
3.5		3.4	9.3	6.9	11.1	18.3	24.0	16.2	7.2	0	0

GPO 840258

DENVER, COLORADO

HYDROMETER Subject to Revision STANDARD SIEVE NUMBER OR SIZE OPENING



PARTICLE-SIZE DIAMETER IN MILLIMETERS

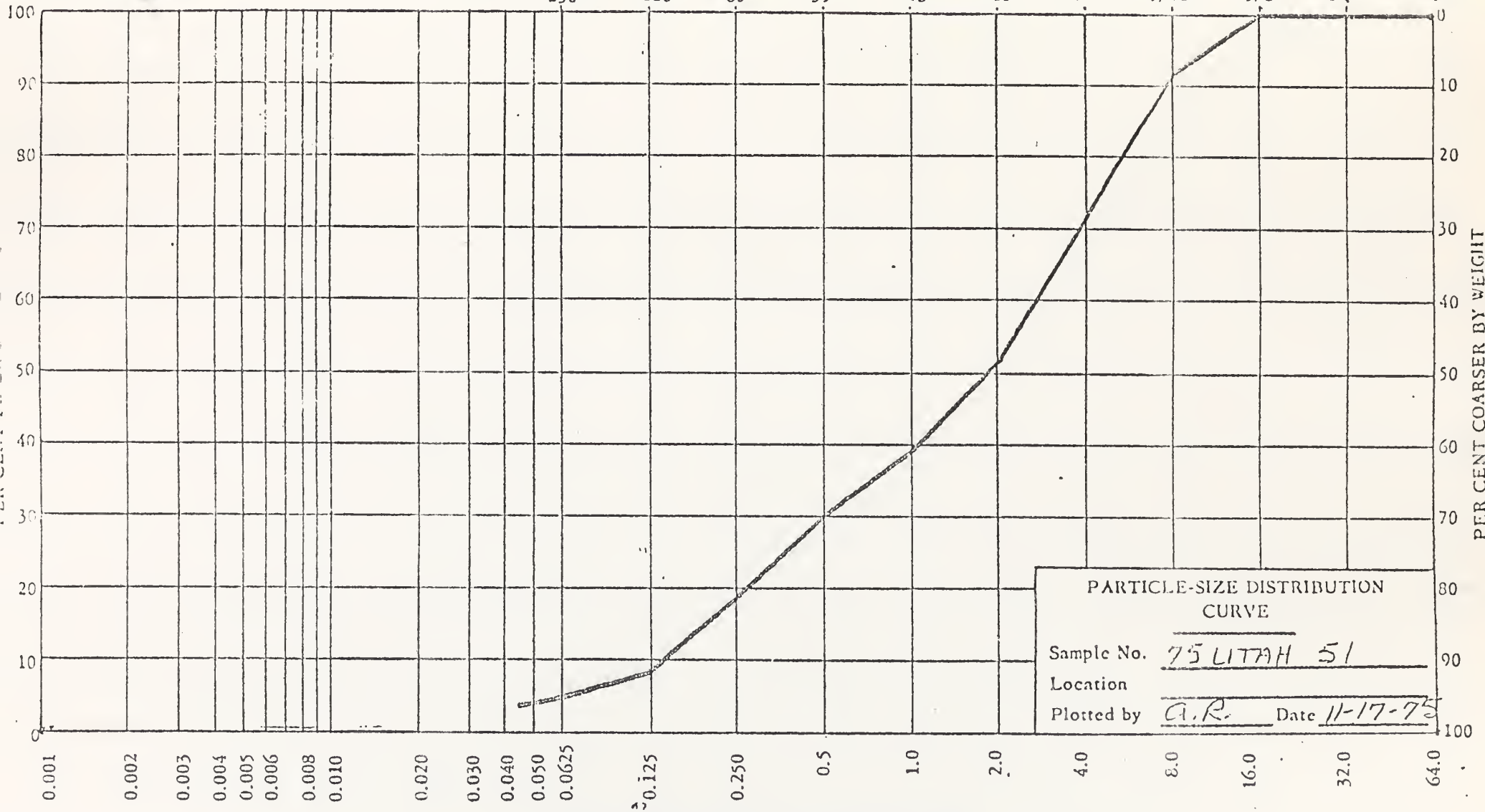
% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625..125	Fine .125..25	Medium .25..5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
	4.0		3.0	7.1	8.4	10.7	12.6	20.7	17.6	12.9	3.0	0

GPO 840250

HYDROMETER Subject to Revision

STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1" 2½"



0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

PARTICLE-SIZE DIAMETER IN MILLIMETERS

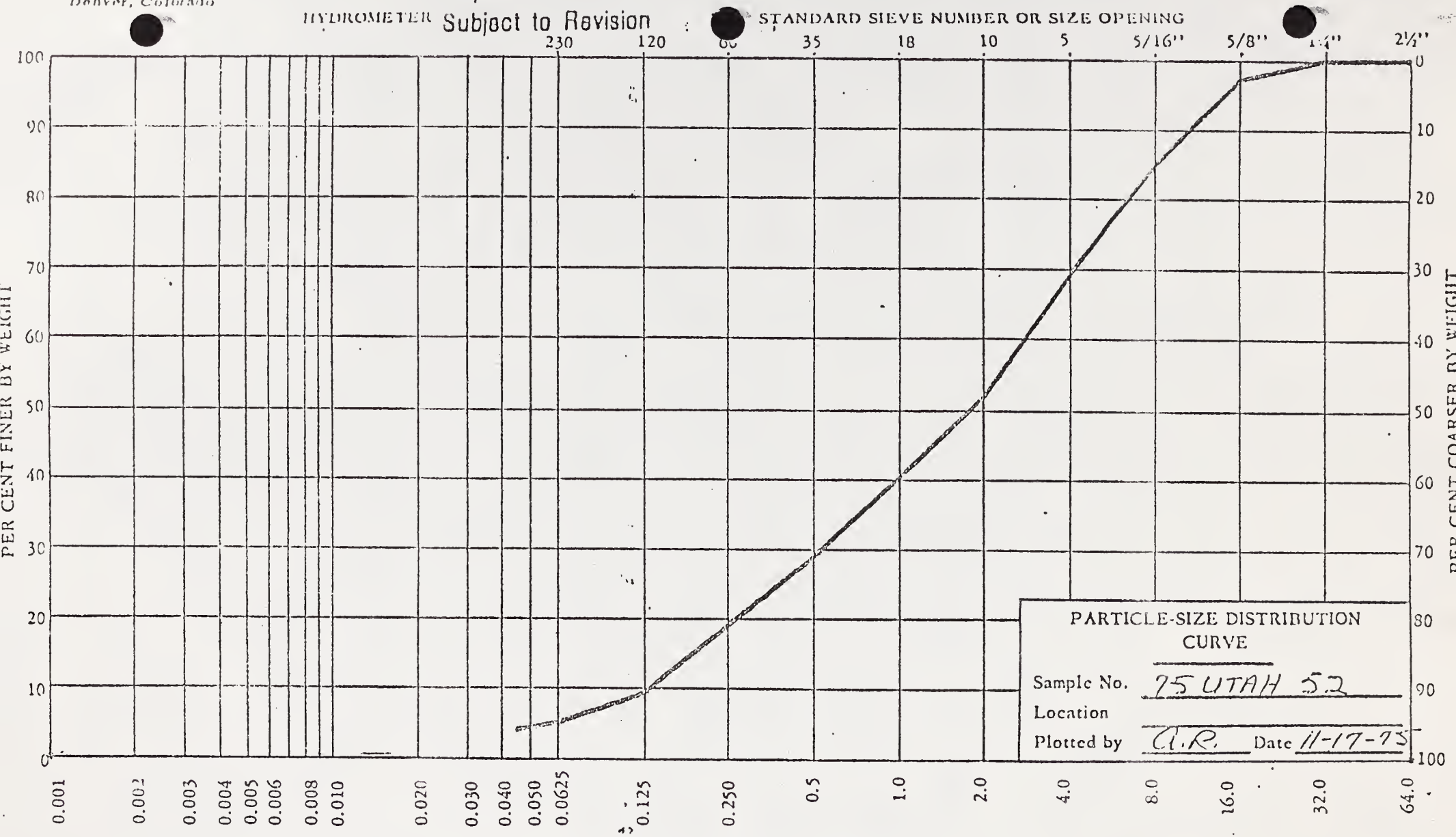
% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
4.3		3.5	10.4	11.3	8.9	12.8	20.4	19.9	8.5	0	0

GPO 840256

Denver, Colorado

Unpublished Records
Subject to Revision



% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
4.7		4.1	9.8	9.9	11.3	12.0	17.6	15.5	12.4	2.8	0

GPO 840250

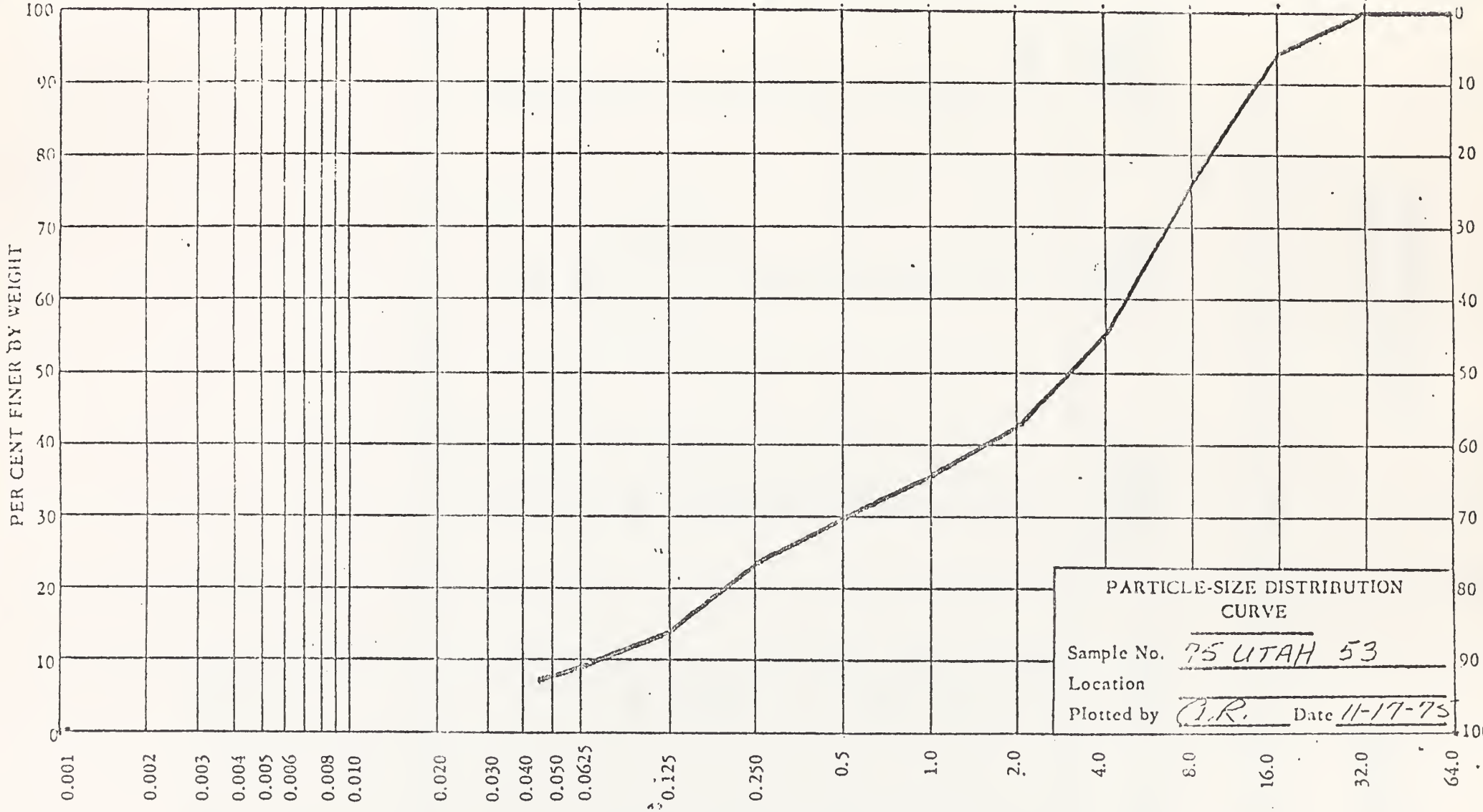
Denver, Colorado

HYDROMETER

Unpublished Records
Subject to Revision

STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1" 2½"



% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
	8.6		4.8	9.6	6.3	5.8	7.1	13.0	20.9	18.2	5.9	0

GPO 840250

Unpublished Records
Subject to Revision

Hydrologic Laboratory
Lakewood, Colorado

Statistical characteristics of grain-size analyses for samples 76UT10-21

Laboratory sample number	Median size (mm)	Sorting coefficient	Skewness	Kurtosis	Uniformity coefficient
76UT10	1.7	2.9	1.1	.23	13.
11	4.2	2.6	.71	.27	19.
12	.31	6.2	4.3	--	--
13	.73	5.0	.78	.19	28.
14	.93	3.3	1.2	.17	19.
15	.38	4.0	3.7	.18	6.2
16	1.1	4.8	.39	.23	41.
17	2.2	4.8	.31	.26	49.
18	2.6	4.6	.41	.26	37.
19	.25	5.7	4.9	--	--
20	.71	5.1	1.4	.21	25.
21	.44	3.0	3.0	$9.6X10^{-2}$	4.3

Unpublished Records
Subject to Revision

Median = d_{50}

Sorting coefficient = $\sqrt{\frac{Q_3}{Q_1}}$

Skewness = $\frac{Q_1 \quad Q_3}{[\text{Median}]^2}$

Kurtosis = $\frac{Q_3 \quad -Q_1}{2(P_{90}-P_{10})}$

Uniformity coefficient sorting index = $\frac{d_{60}}{d_{10}}$

City & State: Salt Lake City, Utah

Proj. name & no.: Oil Shale Project #4649113

County:

Date samples received in lab: September 16, 1975

Latest date results needed: December 1975

SAMPLE ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

Laboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT10	SC			1	09306400 7-10-75	Bed Material						<2mm dia. Xb+Xc; >2mm dia.
11	SC			2	09306405 7-10-75							
12				3	09306410 7-11-75							
13				4	09306415 7-11-75							
14				5	09306430 7-7-75							
15				6	09306500 7-9-75							
16				7	09306600 7-9-75							
17				8	09306605 7-10-75							
18				9	09306610 7-10-75							
19				10	09306620 7-10-75							

20FR75

City & State: Salt Lake City, Utah

Proj. name & no.: Oil Shale Project #4649113

County:

Date samples received in lab:

Latest date results needed: December 1975

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

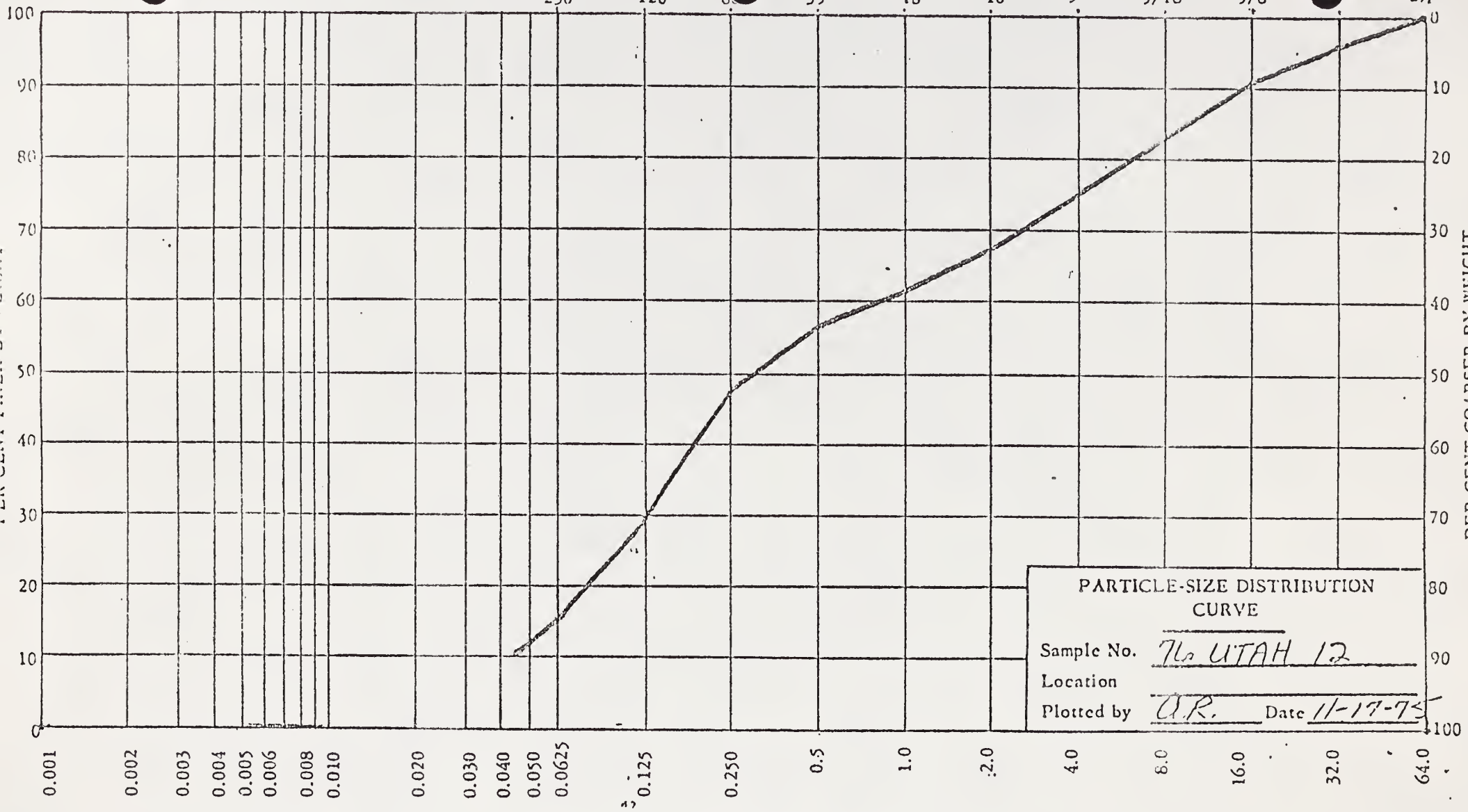
BY LABORATORY

Laboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT20	Sc			11	7-8-75 09306625	Stream Bed Material						< 2mm dia. X6 + X > 2mm dia.
21	"			12	7-8-75 09306700	"						"

20FR75

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 2½"



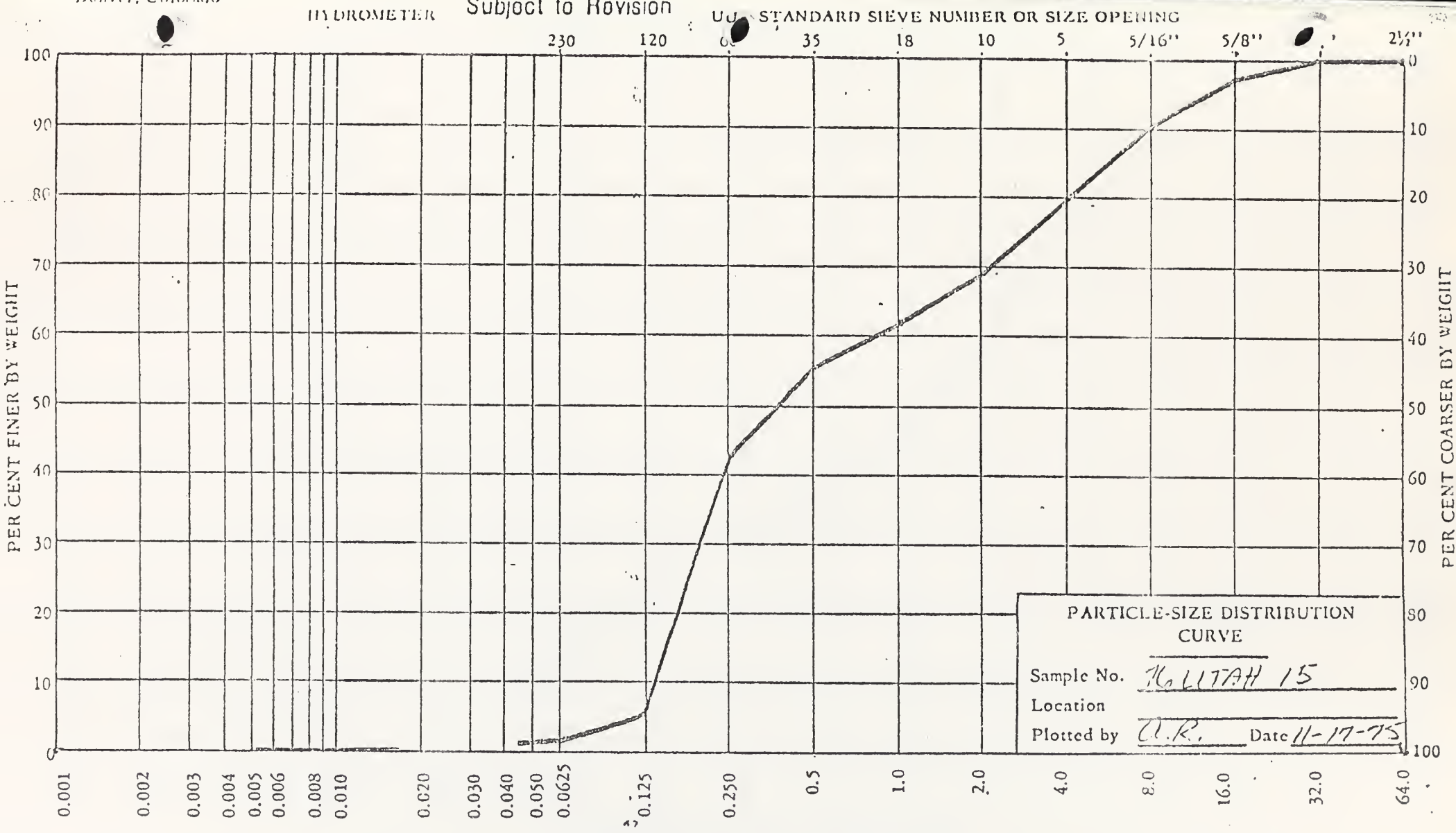
PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
	14.8		14.0	18.5	8.9	5.0	6.0	7.8	7.9	7.9	4.9	4.2

GPO 840256

Denver, Colorado

Subject to Revision



PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. N. UTAH 15

Location

Plotted by D.R. Date 11-17-75

% OF SIZE

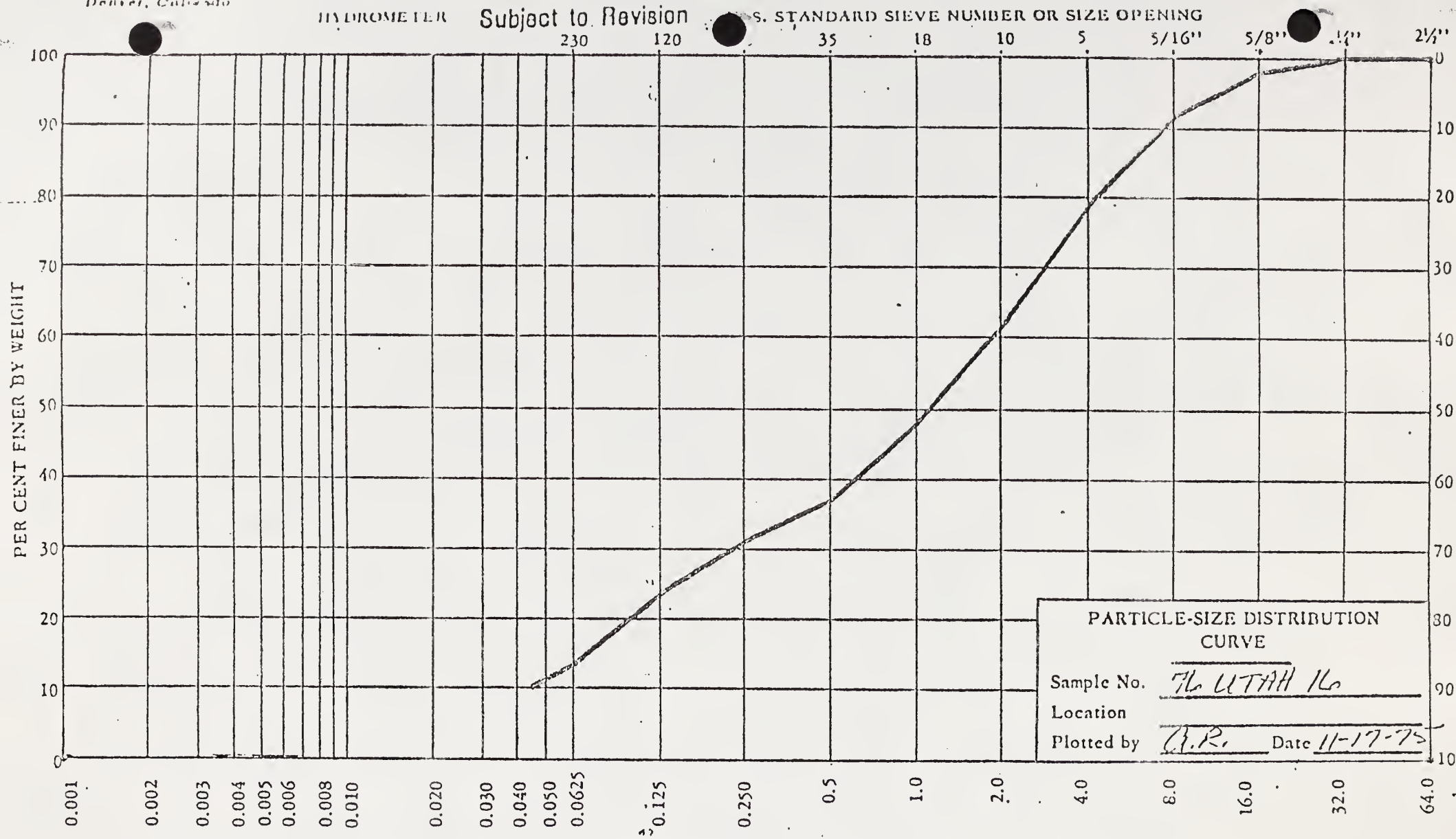
CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
1.2		3.7	37.2	13.0	6.3	7.5	10.9	10.6	6.9	2.7	0

GPO 840258

Denver, Colorado

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 35 18 10 5 5/16" 5/8" ½" 2½"



PARTICLE-SIZE DIAMETER IN MILLIMETERS

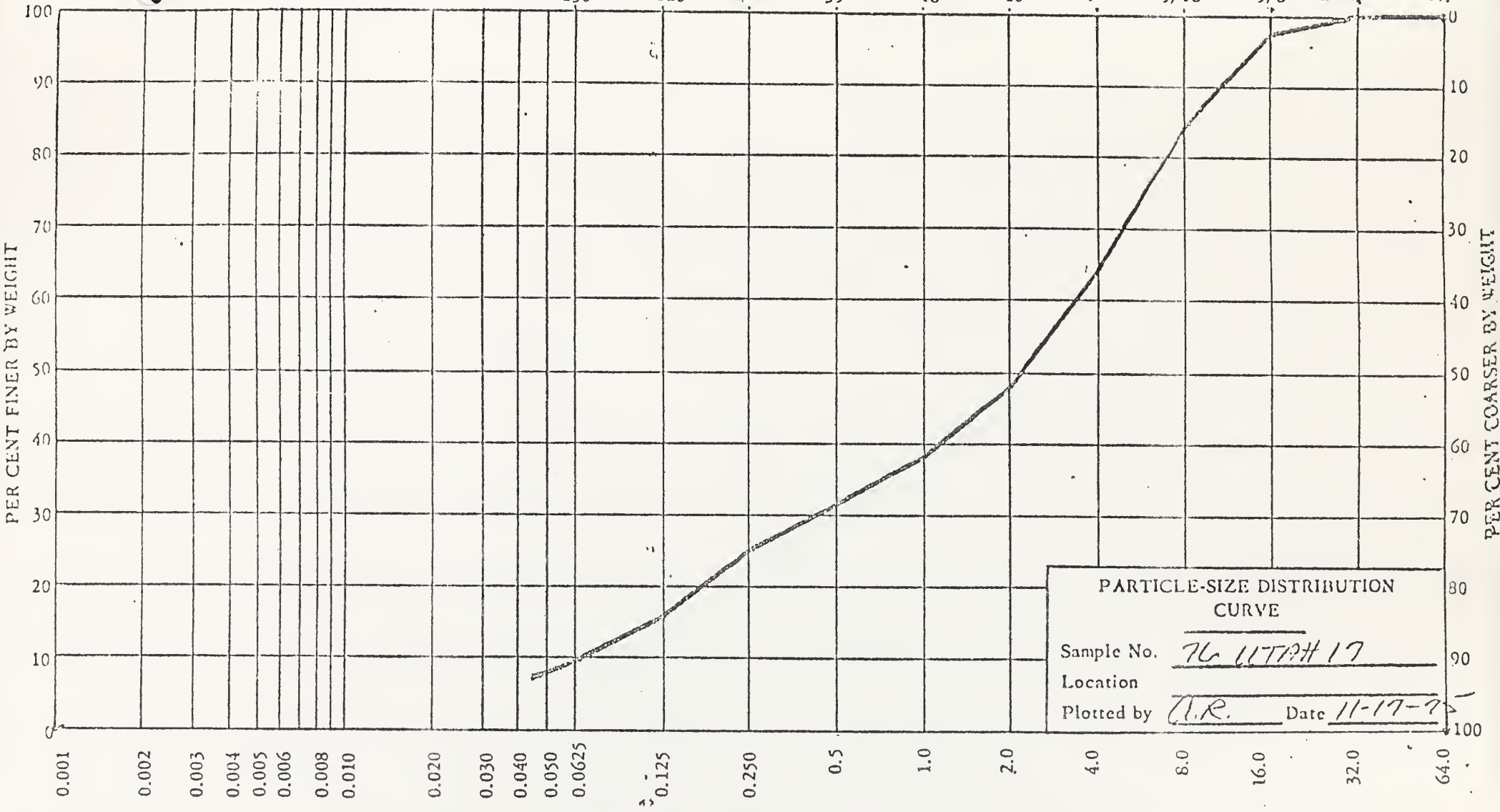
% OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
13.2		10.1	7.5	5.8	11.0	14.2	17.3	12.8	6.3	1.9	0

GPO 840250

Denver, Colorado

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING



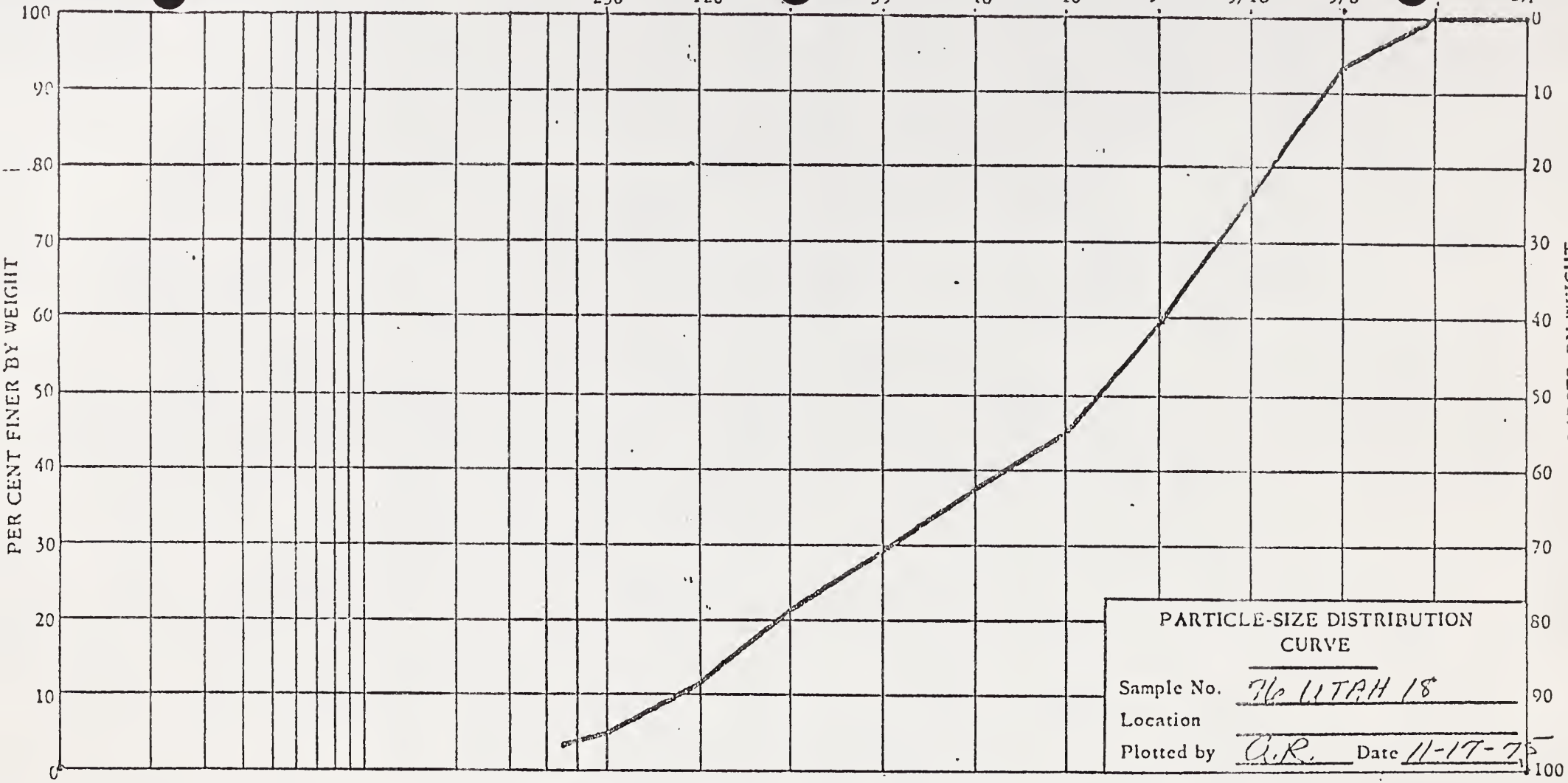
% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
	9.3		6.2	9.3	6.3	6.6	10.1	16.5	19.8	13.3	2.5	0

GPO 840256

HYDROMETER

STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 35 18 10 5 5/16" 5/8" 2½"



0.001 0.002 0.003 0.004 0.005 0.006 0.008 0.010 0.020 0.030 0.040 0.050 0.0625 0.125 0.250 0.5 1.0 2.0 4.0 8.0 16.0 32.0 64.0

PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE

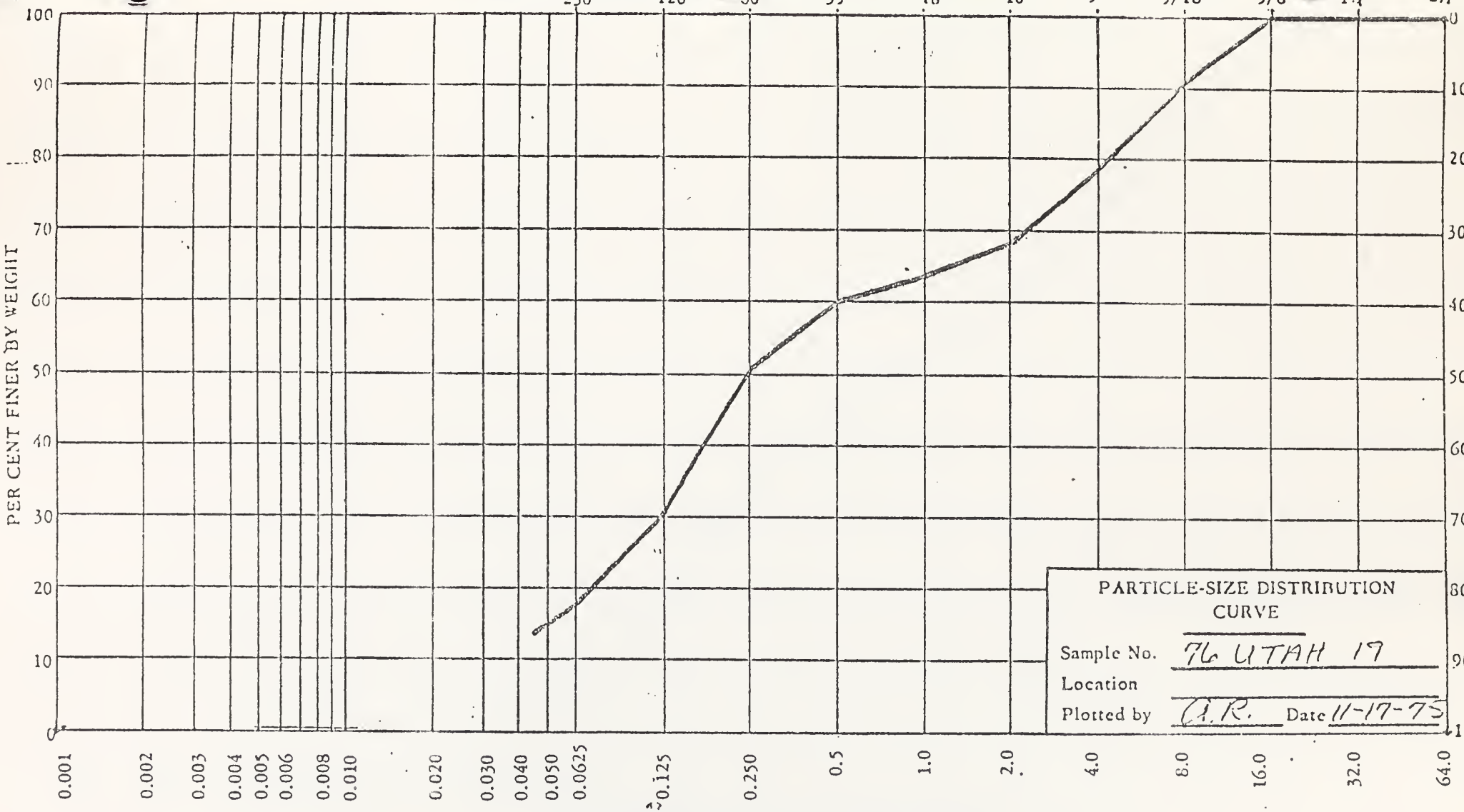
CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625..125	Fine .125..25	Medium .25..5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
4.6		6.5	10.0	7.8	8.2	7.9	14.5	16.9	17.3	6.5	0

GPO 840258

Denver, Colorado

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1¼" 2½"



PARTICLE-SIZE DISTRIBUTION CURVE

Sample No. 76 UTAH 19

Location

Plotted by C.R. Date 11-17-75

% OF SIZE

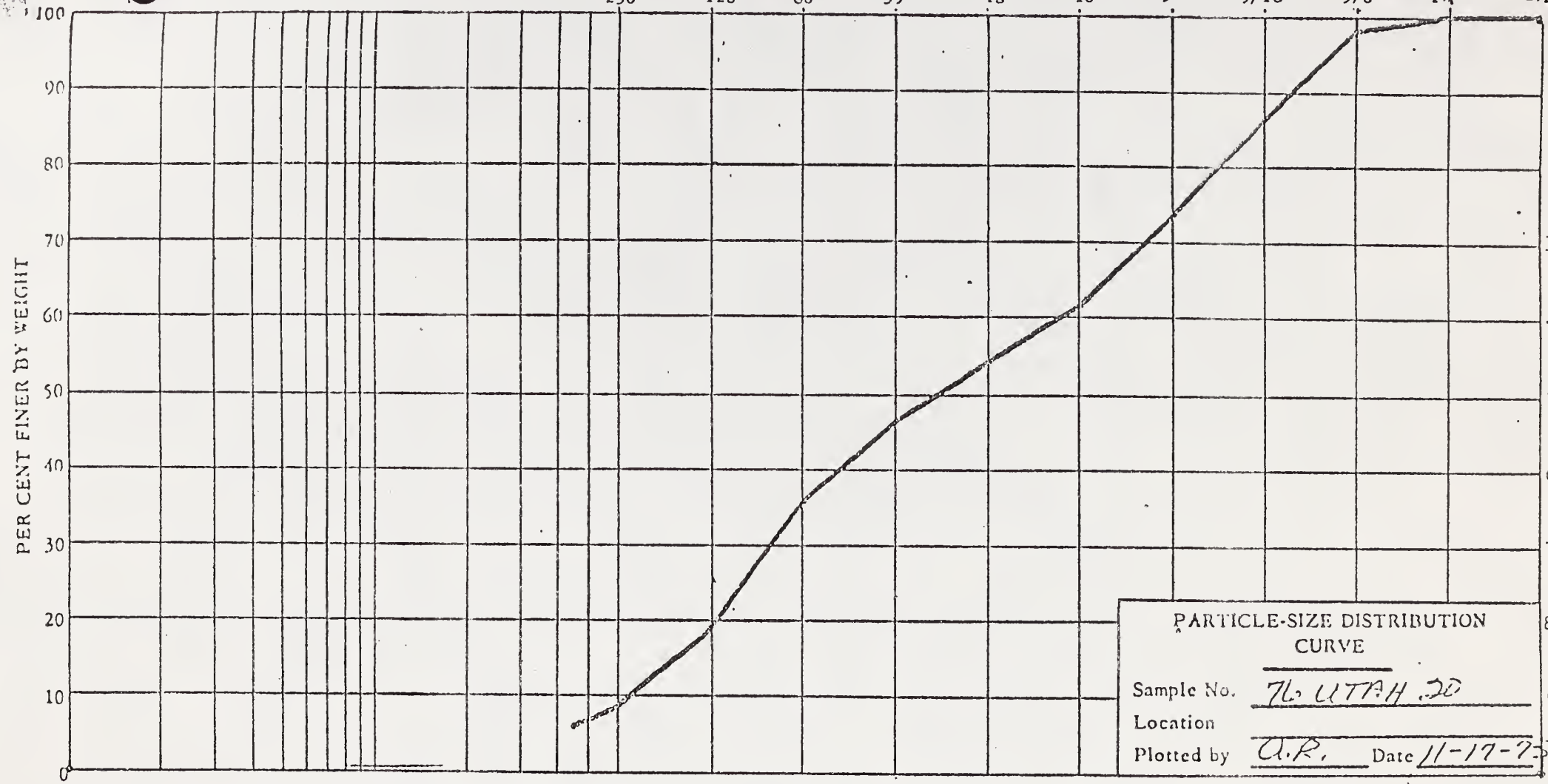
CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
17.2		12.7	20.4	9.5	3.7	4.8	10.4	12.1	9.2	0	0

GPO 840258

Denver, Colorado

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING

230 120 60 35 18 10 5 5/16" 5/8" 1¼" 2½

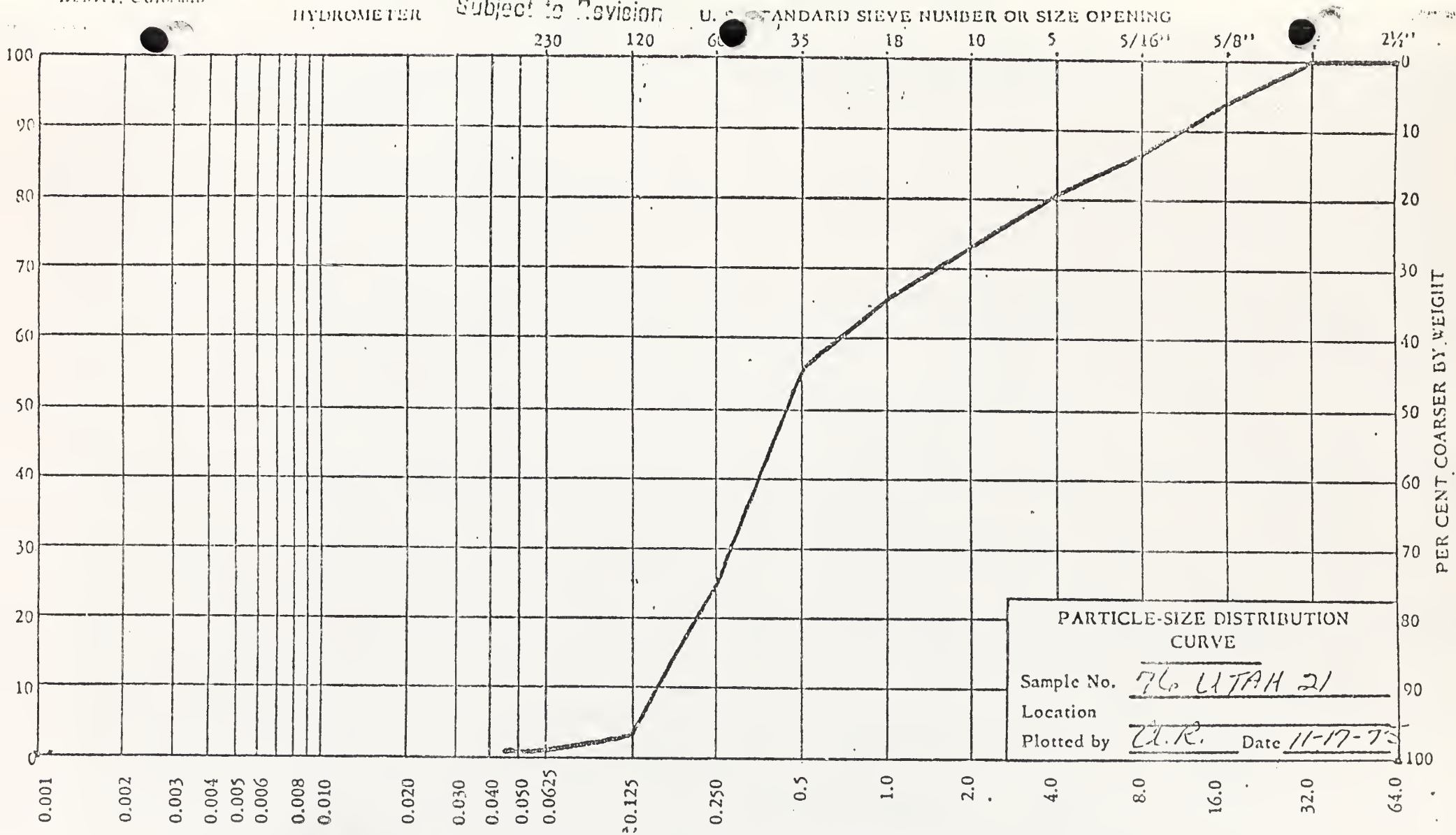


PARTICLE-SIZE DIAMETER IN MILLIMETERS

% OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
	8.2		10.0	17.1	10.6	7.9	7.7	12.0	12.6	12.1	1.8	0

GPO 840258

HYDROMETER Subject to Revision U.S. STANDARD SIEVE NUMBER OR SIZE OPENING



PARTICLE-SIZE DIAMETER IN MILLIMETERS

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004 – 0.0625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V.Coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V.Coarse 32-64
.50		2.1	22.0	30.9	10.1	7.8	7.7	5.8	7.2	5.9	0

GPO 840250

WHITE RIVER ABOVE

	SED	FLOW	NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		S	
													mg/l	CFS	mg/l	CFS	mg/l	CFS						
1																	1105	1657	222	500±				
2					760																		75	245±
3																					27300	410±		
4																	1260	1780						
5													1410		2020	890					17130	310±		
6																								
7	123														2715	950							87	234
8													903				2925	1500						
9																			121	368			89	245
10																	952	1670			2800			
11															2430	1249								
12																					420	335		
13													677	521	2875	1340			144	330				
14																							429	231
15																	810		117	270				
16																							229	285
17																	491	950			221	306		
18															2930									
19																					150	306		
20													621	562	3470	2050			1010					
21																								
22																	1210	815	647	400±				
23													313	1180										
24																	1870	1150			123	390±		
25			287												1705									
26																					120	226		
27													440	500	1505				571	251				
28																								
29													468	500			282	618	916	280±				
30																								
31																					103	238		

WELLS HOLE CANYON [illegible]

	C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11					3550							
12												
13												
14												
15												
16					3120							
17												
18												
19												
20												
21												
22									4200			
23												
24												
25												
26												
27												
28												
29												
30												
31												

EVACUATION CREEK AT WATSON UT 6420

		NOV	DEC	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SE	
				mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS						
1																					
2																74	.01				
3																				39	.01
4			187											114	0.3						
5		21										1125	1.1								
6																		440	.05		
7												4205	1.5								
8											S.S.S. 5-8	401,000 435,000		457,000		173000 175000					
9	17															14300	0.38				
10												34600		188	0.1					43	.01
11						5820															
12																					
13										1490	1.3							363	.01		
14												737	0.8								
15										1750	0.9										
16						2510										66	.00				
17												665	85	71						55	.01
18			84			4470															
19								13000	4.8	2210	4.9					217000	5.8				
20																		67	.01		
21												1640	2.5								
22												4460									
23				113						1285	1.4										
24		182										1845	2.5							297	.45
25														118	.01						
26																				29200	2.0
27																10200	.57	54	.01		
28												776	1.9								
29																					
30										757	1.1										
31																					

	NOV	DEC	JAN	FEB	MAR	APR		MAY		JUN		JUL		AUG		SEP	
						MPN	CFS	MPN	CFS	MPN	CFS						
1																	
2												42					
3		AD														9	.03
4								1052	1.2	48	0.6						
5	145																
6								1575						288	.04		
7	35																
8																	
9							555 529	6460 330 000 513 000		262 000 775 000		40500	1.66				
10																133	.03
11										52	1.5						
12								1225									
13														87	.06		
14								477	0.8								
15																	
16												64	.0				
17										40						84	.03
18								896	1.0								
19												193000 178000	77 71				
20						4670	4.5							51	.05		
21								1525	2.6								
22																	
23						1175	1.6										
24	107															225	.03
25								102	.18								
26								1030	2.5							45200	5.0
27						2490	2.6	659	1.0					33	.09		
28																	
29												565	.08				
30						513	1.7										
31																	

WHITE RIVER NEAR WATSON 6500

		NOV	DEC	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG			
				mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS						
1			147											1510	1657	281	500±			93	230±
2				118						506	420			1340	1560	279	500±	37600 18300	350± 510±	60	245±
3						104		1870				1650	650							55	229
4		192										2350		1430	1797			2230	300		
5												2400						1250	310±		
6	86									856						176	421	1670	300		
7										1260	568			1480	1790	163	470			84	220
8										281	423			1440	1777	109	409			62	220
9				65		94				611	420			1365	1719	251	360	794	340	57	250
10			75					1250	600			2760	880	1160	1600			2620	285±	56	250
11		53										2070		1370	1709			420	250±		
12				154		536		557		660	420	2690 3055	1240			93	285	574			
13										512		2650				226 102	243 330			3870	238
14										570	518			771		141	209				
15								1510	480	339				723		115	239			266	
16										354						94	190±	439	323	204	280
17	99											3700	1460	558	897			211	310	201	267±
18								2600				3785	1775	576	858			170	300±		
19				147						268		3775	2027			6730	221	167	310±		
20										638	560	3510	2100			1420	650±	149			
21										805	504	273	2200	449	767	2600	450±				
22			418	69						491	480	2630 2650	2111 2100			678	400±				
23	135							2840	552	350	478			7450	800	352	330±	128	291	2630	350
24		106										2175		2420	1150			129		710	345
25												1920	1846	820	900			119	300±		
26				166				2040	552	380	550	1040				1830	230	102	250±		
27										484	550					681	267	105	225±		
28										420	535	1905	1485	2520	300±						
29			179	133				618	426	333				204	620	880	280±				
30	96									513	540			231	574	327	230±	95	257		
31																		80	230±		

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SE
						mg/l cfs	mg/l cfs	mg/l cfs			
1	178	270									
2											
3								1660 1707			
4							1960 800				
5											
6						1010 534	2350 920				
7								1480 1887			
8	145										
9						500		1160 1700			
10							6250				
11											
12						620 500					
13							3150 1344				
14						342 581		1180			
15											
16								875 1063			
17							3870				
18											
19						469 500	3400 2021				
20											
21						1600 535					
22											
23											
24							1680 2005				
25											
26						370 450	2000				
27											
28						640 550					
29											
30											
31											

SOUTHAM CANYON UPPER STATION 6605

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12					739							
13					2020							
14												
15												
16												
17												
18												
19												
20												
21												
22									4420 1.32			
23												
24												
25												
26												
27												
28												
29												
30												
31												

	O-	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SE
					migll							
1												
2												
3												
4												
5												
6												
7												
8												
9												
10					1860							
11												
12					3080							
13												
14												
15												
16												
17												
18												
19												
20												
21									8730 17			
22									12300 20			
23												
24												
25												
26												
27												
28												
29												
30												
31												

ASPHALT WASH BELOW CENTRE FORK 6620

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SE
1												
2												
3												
4												
5												
6												
7												
8												
9												
10					18600							
11					1000 1120							
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												

ASPHALT WASH NEAR MOUTH 6625

	O	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	S
					wgtl							
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11					1960							
12					2110							
13												
14												
15												
16												
17												
18												
19												
20												
21												
22									73,600 32,600 1.55	5.5.5. 6-12 61,800 30,400		
23												
24												
25												87700
26												
27												
28												
29												
30												
31												

WHITE RIVER BELOW ASPHALT WASH 0785

	OCT		NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP	
	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS	mg/l	CFS
1											2930						1690	1639	478	487			122	252
2					2610								598	395			1500	1535	331		27500	6203	120	247
3			355						154						1010						28500	355	86	217
4															1350	800	1890	1628			5070	332		
5															2010						1540	327		
6													638	490					268	295	1230	271		
7													1130	500	2420	950	1450	1603	301	400			202	235
8													820	[illegible]			1230	1606	180	307			85	224
9	2510										946	360	716	534					3190	381	395	243	94	243
10															2740	880	1610	1494			2970	224		
11															2160		1650	1550			1720	235		
12											701		701	500					208	2901	545	329		
13													415	460	4320	1430					1150	389	89	220
14													319	465	3310	1430	891		293	235			554	228
15							1360						510	574			922	1300	192	271				
16													460	525			7311	1833	165	137	466	330	568	260
17					1320										2820		1070	8156			374	247		
18											2620	616			3350	1810	616	786			231	310	338	313
19									653				300	514	4650	1891			176		214	239		
20													1170	580	3680	2086			3430	313	205	247		
21							2360						1100	520			559	691	2440	461				
22													710	480			547	650	1440	370				
23													270	465			3830 1240	804	636	330	181			
24																	6910	970			154	290	2530	355
25											2150	556			1330	1788	1300				171	302		
26									603				650	500	1740				1420		125	250		
27													900	530	2000	1535			614	217	129	224	929	465
28													450		1860		559	604	1660	332			746	375
29																	555	549	1580					
30							2360						625				549	625	651	2201	127	243		
31																					110	217		

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	mg/l CaS	mg/l CaS										
1												
2												
3												
4		242 363										
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17		163										
18												
19												
20	187 390											
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												

	6:00	12:00	18:00	2400	6:00	12:00	18:00	2400
1							4860	17500
2		331				27500		
3						28500		
4						5070		
5				172		1540		
6		268	178	199		1230		
7	173	301	161					
8		155 180	122	133				
9		137	1570 3190	447		395		471
10	242	177	161	141		3110 2970		2070
11	138	105	116	191	3800	2200 1720	921	650
12	170	165 208			638	619	592 545	727
13					650	1100 1150	1260	5740
14		292			1520		425	483
15		192			1210	778	729	536
16		165			649	406 466	735	523
17						369 374	313	373
18					736	234 231	458	
19		176				214		
20		3430				205		
21		2440						
22		1440						
23		1080 636		742		181		
24		661	592	520		154		
25	893	530	529			171		
26		1420		1620		125		
27	1200	674	727	1060		129		
28	854	1660	2300	2180		127		
29		1570 1580		826		110		
30	117	[illegible] 651		355				
31				478				

SEPTEMBER

	6:00	12:00	18:00	2400
1		122		
2		120		
3		86		
4				
5				
6				
7		202		
8		85		
9		84		
10		96		
11				
12				
13		89		
14		554		
15		568		
16				
17		338		
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				

NOV

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6		487	527	502
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8		536		
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11		306		
12		MOUSE		
13		488		
14		591		
15			250	
16			269	
17			193	
18			210	
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OCTOBER

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09306400

RIVER [illegible]

DATE [illegible]

TIME —

STATION [illegible] 50, 60, 70, [illegible]

PRE-SIEVE WT. 492.4 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	[illegible]	17.0	83
8.000	[illegible]	24.0	51
4.000	84.6	17.2	41.8
2.000	42.9	8.7	33.1
1.000	24.6	5.0	28.1
.500	25.1	5.1	23
.250	63.[illegible]	12.9	10.1
.125	40.[illegible]	8.2	1.9
.062	5.6	1.1	.8
PAN	3.9	.8	0
TOTAL	492.4	100	

ANALYZED BY: [illegible]

DATE: [illegible]

RIVER [illegible]

DATE [illegible]

TIME —

STATION [illegible]

PRE-SIEVE WT. 268.5 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	32.7	12.2	87.8
8.000	60.5	22.5	65.3
4.000	24.5	9.1	56.2
2.000	15.8	6.0	50.2
1.000	8.4	3.1	47.1
.500	4.0	1.5	45.6
.250	5.4	2.0	43.6
.125	14.9	5.5	38.1
.062	30.7	11.4	26.7
PAN	71.6	26.7	0
TOTAL	268.5	100	

ANALYZED BY: [illegible]

DATE: [illegible]

UNPUBLISHED RECORDS
SUBJECT TO REVISION

OK SHIKE #1

RIVER [illegible]

DATE [illegible]

TIME —

STATION [illegible]

PRE-SIEVE WT. 483.9 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	[illegible]	[illegible]	77.7
8.000	111.1	23.0	54.7
4.000	[illegible]	11.8	[illegible]
2.000	39.0	8.1	[illegible]
1.000	22.0	4.5	27.8
.500	26.5	5.5	22.3
.250	58.8	12.1	10.2
.125	38.4	8.0	2.2
.062	[illegible]	[illegible]	.9
PAN	4.4	[illegible]	0
TOTAL	483.?	100	

ANALYZED BY: [illegible]

DATE: [illegible]

OK SHIKE #2

09430530

RIVER [illegible]

DATE [illegible]

TIME

STATION 20 [illegible]

PRE-SIEVE WT. 140.8 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	23.0	16.3	83.7
8.000	30.5	21.7	62.0
4.000	[illegible]	8.6	53.4
2.000	5.4	3.8	49.6
1.000	2.9	2.1	47.5
.500	1.9	1.3	46.2
.250	2.7	1.9	44.3
.125	8.3	5.9	38.4
.062	18.8	13.4	25.0
PAN	35.2	25.0	0
TOTAL	140.8	100	

ANALYZED BY: [illegible]

DATE: 8-19-76

WHITE RIV. ABV. HALLS FORK CENT. — 09306400

BED MATERIAL

DATE 7-7-76 TIME _____ GHT. _____ TEMP. _____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000
[illegible]	1	2	10	23	27	32	42	59	85	100	100
[illegible]	37	37	41	46	47	54	64	78	92	100	100
[illegible]	14	20	27	34	37	42	49	62	86	100	100

RIVER [illegible]

DATE [illegible]

TIME —

STATION [illegible]

PRE-SIEVE WT. [illegible] GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	69.9	13.6	86.4
8.000	47.9	10.4	76.
4.000	5.1	13.1	63.9
2.000	69.5	15.0	48.9
1.000	47.1	17.0	31.9
.500	66.8	14.4	17.5
.250	25.2	5.3	9.2
.125	22.3	4.8	4.4
.062	9.5	2.1	2.3
PAN	10.1	2.3	0
TOTAL	[illegible]	100	

ANALYZED BY: [illegible]

DATE: [illegible]

RIVER [illegible]

DATE [illegible]

TIME —

STATION [illegible]

PRE-SIEVE WT. 298.1 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	18.6	6.2	93.8
8.000	13.3	4.5	89.3
4.000	19.1	6.6	82.7
2.000	16.3	5.5	77.2
1.000	20.6	6.9	70.3
.500	28.5	9.5	60.8
.250	44.2	14.8	46
.125	68.2	21.0	25
.062	41.5	13.9	11.1
PAN	33.1	11.1	0
TOTAL	[illegible]	100	

ANALYZED BY: [illegible]

DATE: [illegible]

UNPUBLISHED RECORDS
SUBJECT TO REVISION

RIVER [illegible]

DATE 7-25-16

TIME —

STATION [illegible]

PRE-SIEVE WT. 439.3 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	5.0	1.1	98.9
8.000	54.9	12.5	86.4
4.000	113.1	25.7	60.7
2.000	68.1	15.5	45.2
1.000	70.5	16.0	29.2
.500	61.6	14.0	15.2
.250	49.9	11.4	3.8
.125	29.7	6.8	3.0
.062	12.1	2.7	0.3
PAN	1.3.4	3.1	0
TOTAL	439.2	100	

ANALYZED BY: [illegible]

DATE: [illegible]

RIVER [illegible]

DATE [illegible]

TIME [illegible]

STATION [illegible]

PRE-SIEVE WT. 532.2 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	31.5	8.4	91.6
8.000	34.6	9.3	82.3
4.000	20.2	5.9	76.4
2.000	16.6	4.4	72
1.000	12.5	4.9	67.1
.500	27.4	7.3	59.8
.250	48.2	12.9	46.9
.125	75.5	20.2	26.7
.062	53.4	14.9	11.8
PAN	44.6	11.8	0
TOTAL	374.2	100	

ANALYZED BY: [illegible]

DATE: 8/12/16

OIL SHALE

EVACUATION CREEK NR. MOUTH 09306430

BED MATERIAL

DATE 7-8-76 TIME ____ GHT. ____ TEMP. ____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000
3-17	2 / 4	/ 9	/ 18	/ 32	/ 49	/ 64	/ 76	/ 96	/ 100	/ 100	
2-26	11 / 25	/ 46	/ 61	70	/ 77	/ 83	/ 89	/ 94	/ 100	/ 100	
AVE	6 / 14	/ 27	/ 40	/ 51	/ 63	/ 74	/ 82	/ 90	/ 100	/ 100	
3-17	3 / 6	/ 13	/ 22	/ 34	/ 51	/ 70	/ 86	/ 99	/ 100	100	
2-26	12 / 30	/ 47	/ 60	/ 67	72	/ 76	/ 82	/ 92	/ 100	/ 100	
AVE	8 / 16	/ 30	/ 42	/ 52	/ 62	/ 73	/ 84	/ 96	/ 100	/ 100	

RIVER [illegible]

DATE [illegible]

TIME

STATION [illegible]

PRE-SIEVE WT. 429.3 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	66.1	15.4	84.6
8.000	30.0	7.0	77.6
4.000	9.7	2.3	75.3
2.000	3.6	.8	74.5
1.000	2.9	.7	73.8
.500	1.5	.3	73.5
.250	15.0	3.5	69.9
.125	165.2	38.5	31.4
.062	16.3	3.8	27.6
PAN	66.8	15.6	0
TOTAL	429.1	100	

ANALYZED BY: [illegible]

DATE: [illegible]

RIVER [illegible]

DATE [illegible]

TIME [illegible]

STATION [illegible]

PRE-SIEVE WT. 411.0 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			100
32.000	19.1	5.4	94.6
16.000	27.9	6.8	87.8
8.000	32.0	7.8	80
4.000	11.0	2.7	77.3
2.000	4.3	1.0	76.3
1.000	2.4	.6	75.7
.500	1.2	.3	75.4
.250	10.6	2.6	72.8
.125	152.5	37.1	35.7
.062	75.6	18.4	17.3
PAN	70.9	17.3	0
TOTAL	410.7	100	

ANALYZED BY: [illegible]

DATE: 8-24-76

UNPUBLISHED RECORDS
SUBJECT TO REVISION

SIX SAMPLE

WHITE RIVER NR. WATSON IND. 09306500

BED MATERIAL

DATE 6-7-82 TIME ____ GHT. ____ TEMP. ____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000	
[illegible]	16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
AVG	16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

UNPUBLISHED RECORDS
SUBJECT TO REVISION

OIL SHALE

RIVER [illegible]

DATE 7-1-76

TIME —

STATION [illegible]

PRE-SIEVE WT. 255.3 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			100
32.000	[illegible]	5.3	[illegible]
16.000	26.2	10.3	[illegible]
8.000	[illegible]	12.7	[illegible]
4.000	[illegible]	11.2	[illegible]
2.000	[illegible]	6.7	[illegible]
1.000	[illegible]	5.0	[illegible]
.500	21.0	[illegible]	[illegible]
.250	[illegible]	[illegible]	[illegible]
.125	[illegible]	[illegible]	[illegible]
.062	1.0	.4	.2
PAN	.6	.2	0
TOTAL	255.3	100	

ANALYZED BY: [illegible]

DATE: 7-16-76

RIVER [illegible]

DATE 7-7-16

TIME [illegible]

STATION [illegible]

PRE-SIEVE WT. 161.0 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	7.5	4.7	95.3
8.000	17.9	11.1	84.2
4.000	10.4	6.5	77.7
2.000	7.8	4.8	72.9
1.000	5.3	3.3	69.6
.500	16.0	9.9	59.7
.250	76.4	47.5	12.2
.125	18.9	11.7	.5
.062	.7	.4	.1
PAN	.1	.1	0
TOTAL	161	100	

ANALYZED BY: [illegible]

DATE: 8-24-16

RIVER [illegible]

DATE [illegible]

TIME —

STATION [illegible]

PRE-SIEVE WT. 145.2 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	3.9	2.7	97.3
8.000	2.8	1.9	95.4
4.000	4.4	3.1	90.3
2.000	7.5	5.2	85.1
1.000	8.1	5.8	79.3
.500	20.7	14.3	65
.250	75.8	52.2	12.8
.125	17.2	11.8	1.0
.062	1.0	.7	.3
PAN	.4	.3	0
TOTAL	145.1	100	

ANALYZED BY: [illegible]

DATE: 8-24-16

UNPUBLISHED RECORDS
SUBJECT TO REVISION

09306600 WHITE RIV. NR SOUTHAM CANY.

BED MATERIAL

DATE 5-5-76 TIME ____ GHT. ____ TEMP. ____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0	1	13	54	79	87	90	95	97	100	100
[illegible]	3	1	12	62	91	97	98	98	99	100	100

OIL SHALE #1

[illegible]05

RIVER SOUTH AM CANY WASH-NR WATSON

DATE 5-5-76

TIME —

STATION 2,4,6,8,10,12,14,16

PRE-SIEVE WT. 443.4 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			
16.000			100
8.000	55.5	12.5	87.5
4.000	91.0	20.5	67
2.000	71.0	16.0	51
1.000	53.6	12.1	38.9
.500	35.6	8.0	30.9
.250	41.6	9.4	21.5
.125	38.5	8.7	12.8
.062	22.9	5.2	7.6
PAN	33.5	7.6	0
TOTAL	443.2	100	

ANALYZED BY: [illegible]

DATE: 8-24-76

OIL SHALE #2

09306605

RIVER SOUTH AM CANY WASH NR. WATSON

DATE 5-5-76

TIME —

STATION 2,4,6,8,10,12,14,16

PRE-SIEVE WT. 503.0 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	25.9	5.2	94.8
8.000	88.8	17.7	77.1
4.000	96.3	19.1	58
2.000	67.7	13.5	44.5
1.000	50.5	10.0	34.5
.500	34.9	6.9	27.6
.250	43.3	8.6	19
.125	41.3	8.2	10.8
.062	22.4	4.5	6.3
PAN	31.8	6.3	0
TOTAL	502.9	100	

ANALYZED BY: [illegible]

DATE: 8-25-76

UNPUBLISHED RECORDS
SUBJECT TO REVISION

OIL SHALE

09306605 SOUTHAM CANY. WASH NR. WATSON

BED MATERIAL

DATE 5-5-76 TIME ____ GHT. ____ TEMP. ____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000
2-16	8%	13%	22%	31%	39%	51%	67%	88%	100%	100%	100%
2-16	6%	11%	19%	27%	34%	44%	58%	77%	95%	100%	100%
2-16	7%	12%	20%	30%	36%	47%	62%	82%	98%	100%	100%

OIL SHALE

09306610

RIVER SOUTHAM CANY WASH @ MOUTH

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16

PRE-SIEVE WT. 92.2 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			
16.000			100
8.000	8.8	9.6	90.4
4.000	7.4	8.0	82.4
2.000	6.1	6.6	75.8
1.000	5.7	6.2	69.6
.500	5.5	6.0	63.6
.250	13.5	14.7	48.9
.125	22.6	24.6	24.3
.062	12.2	13.3	11
PAN	10.2	11.0	0
TOTAL	92.0	100	

ANALYZED BY: [illegible]

DATE: 8-25-76

UNPUBLISHED RECORDS
SUBJECT TO REVISION

OIL SHALE #1

09306620

RIVER ASPHALT WASH, BLW CENTER FORK

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16,18,20

PRE-SIEVE WT. 523.1 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	46.9	8.2	91.8
8.000	60.6	10.6	81.2
4.000	92.4	16.1	65.1
2.000	68.5	12.0	53.1
1.000	47.1	8.2	44.9
.500	41.6	7.3	37.6
.250	67.7	11.8	25.8
.125	59.5	10.4	15.4
.062	42.1	7.3	8.1
PAN	46.6	8.1	0
TOTAL	523.0	100	

ANALYZED BY: [illegible]

DATE: 8-16-76

OIL SHALE #2

09306620

RIVER ASPHALT WASH, BLW CENTER FORK

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16

PRE-SIEVE WT. 509.1 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000	—		
32.000	—		100
16.000	4.7	.9	99.1
8.000	34.7	6.8	92.3
4.000	49.2	9.7	82.6
2.000	43.2	8.5	74.1
1.000	35.7	7.0	67.1
.500	30.8	6.0	61.1
.250	74.9	14.7	46.4
.125	127.8	25.1	21.3
.062	69.0	13.6	7.7
PAN	39.0	7.7	0
TOTAL	509.0	100	

ANALYZED BY: [illegible]

DATE: 8-16-76

UNPUBLISHED RECORDS
SUBJECT TO REVISION

[illegible] SIZE SHARE #3

RIVER ASPHALT WASH BLW CENTER FORK

DATE [illegible]-76

TIME —

STATION 2,4,6,8,10,12,14,16,18,20

PRE-SIEVE WT. 598.1 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	8.9	1.5	98.5
8.000	85.9	14.4	84.1
4.000	111.0	18.6	65.5
2.000	86.2	14.4	51.1
1.000	62.7	10.5	40.6
.500	51.2	8.5	32.1
.250	66.0	11.0	21.1
.125	49.5	8.3	12.8
.062	38.1	6.4	6.4
PAN	38.4	6.4	0
TOTAL	597.9	100	

ANALYZED BY: [illegible]

DATE: 8-16-76

[illegible] SIZE SHARE #4

09306620

RIVER ASPHALT WASH BLW CENTER FORK

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16,18,20

PRE-SIEVE WT. 573.9 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000	—		100
16.000	10.9	1.9	98.1
8.000	81.1	14.1	84.0
4.000	106.3	18.5	65.5
2.000	82.3	14.3	51.2
1.000	56.1	9.8	41.4
.500	44.3	7.7	33.7
.250	61.6	10.7	23.0
.125	53.8	9.4	13.6
.062	43.8	7.6	6.0
PAN	33.7	5.9	0
TOTAL	573.9	100	

ANALYZED BY: [illegible]

DATE: 8-17-76

51L SHALE #5

09036620

RIVER [illegible]

DATE 8-3-76

TIME —

STATION 4, 4, 6, 8, 10, 12, 14, 16, 18, 20

PRE-SIEVE WT. 489.0 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	11.3	2.3	97.7
8.000	41.1	8.4	89.3
4.000	85.0	17.4	71.9
2.000	72.8	14.9	57.0
1.000	51.1	10.5	46.5
.500	43.6	8.9	37.6
.250	60.3	12.3	25.3
.125	49.2	10.1	15.2
.062	45.8	9.4	5.8
PAN	28.5	5.8	0
TOTAL	488.7	100	

ANALYZED BY: [illegible]

DATE: 8-11-76

OIL SHALE

ASPHALT WASH BLW. CENTER FORK - 09306620

BED MATERIAL

DATE 8-3-76 TIME _____ GHT. _____ TEMP. _____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000
2-20	8 /	15 /	26 /	32 /	45 /	53 /	65 /	81 /	92 /	100 /	100 /
2-16	2 /	21 /	46 /	61 /	87 /	94 /	23 /	92 /	99 /	100 /	100 /
2-20	6 /	13 /	21 /	32 /	41 /	51 /	66 /	24 /	98 /	100 /	100 /
2-20	6 /	14 /	23 /	34 /	41 /	51 /	66 /	84 /	97 /	100 /	100 /
2-20	6 /	15 /	25 /	32 /	46 /	57 /	72 /	89 /	98 /	100 /	100 /
TOTAL	34 /	78 /	141 /	203 /	240 /	286 /	352 /	420 /	485 /	500 /	500 /
AVG	7 /	16 /	28 /	41 /	48 /	57 /	70 /	84 /	97 /	100 /	100 /

09306625 — OIL SHALE #1

RIVER Asphalt Wash @ mouth nr. Watson

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16

PRE-SIEVE WT. 483.3 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	6.9	1.4	98.6
8.000	41.0	8.5	90.1
4.000	70.4	14.6	75.5
2.000	87.8	18.2	57.3
1.000	74.0	15.3	42.0
.500	46.6	9.6	32.4
.250	50.6	10.5	21.9
.125	48.8	10.1	11.8
.062	36.4	7.5	4.3
PAN	20.6	4.3	0
TOTAL	483.1	100	—

ANALYZED BY: [illegible]

DATE: 8-17-76

09306625 — OIL SHALE #2

RIVER Asphalt Wash @ mouth nr. Watson

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16

PRE-SIEVE WT. 534.6 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	2.9	.5	99.5
8.000	77.8	14.0	85.5
4.000	92.4	16.7	68.8
2.000	90.5	16.3	52.5
1.000	70.4	12.7	39.8
.500	45.0	8.1	31.7
.250	55.7	10.0	21.7
.125	61.9	11.2	10.5
.062	34.3	6.2	4.3
PAN	23.7	4.3	0
TOTAL	554.6	100	

ANALYZED BY: [illegible]

DATE: 8-17-76

UNPUBLISHED RECORDS
SUBJECT TO REVISION

OIL SHALE #3

[illegible]6625

RIVER [illegible]

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16,19

PRE-SIEVE WT. 532.7 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	20.9	3.9	96.1
8.000	74.3	14.0	82.1
4.000	80.3	15.1	67
2.000	84.6	15.9	51.1
1.000	72.7	13.6	37.5
.500	54.5	10.2	27.3
.250	59.1	11.1	16.2
.125	44.5	8.4	7.8
.062	23.5	4.4	3.4
PAN	18.3	3.4	0
TOTAL	532.7	100	

ANALYZED BY: [illegible]

DATE: 8-14-76

OIL SHALE #4

[illegible]6625

RIVER [illegible]

DATE 8-3-76

TIME —

STATION 2,4,6,8,10,12,14,16,19,22

PRE-SIEVE WT. 562.0 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	10.5	2.0	98
8.000	86.3	15.4	82.6
4.000	98.5	17.5	65.1
2.000	95.2	16.9	48.2
1.000	71.5	12.7	35.5
.500	49.7	8.8	26.7
.250	58.4	10.4	16.3
.125	46.2	8.2	8.1
.062	27.2	4.8	3.3
PAN	18.4	3.3	0
TOTAL	561.9	100	

ANALYZED BY: [illegible]

DATE: 8-18-76

OIL SHALE

ASPHALT WASH @ MOUTH MR. WATSON — 09306625

BED MATERIAL

DATE 8-3-76 TIME ——— GHT. ——— TEMP. ———

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000
2-16	4	12	22	32	42	57	76	90	99	100	100
2-17	4	10	22	32	40	52	69	86	100	100	100
2-19	3	8	16	27	38	51	67	82	96	100	100
2-22	3	8	16	27	36	47	65	83	92	100	100
TOTAL	14	38	76	118	156	207	277	341	393	450	450
AVG.	4	10	19	30	39	52	69	85	98	100	100

OIL SHALE

09306700

RIVER WHT. RIV. RIV. ASPHALT WASH

DATE 8-3-76

TIME —

STATION 0, 15, 30, 45, 60, 75, 90, 105, 120, 125

PRE-SIEVE WT. 462.7 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			100
32.000	20.3	4.4	95.6
16.000	87.9	19.0	76.6
8.000	120.8	26.1	50.5
4.000	49.3	10.7	39.8
2.000	18.1	3.9	35.9
1.000	9.0	1.9	34
.500	5.6	1.2	32.8
.250	7.2	1.6	31.2
.125	21.4	4.6	26.6
.062	50.5	10.9	15.7
PAN	72.6	15.7	0
TOTAL	462.7	100	

ANALYZED BY: [illegible]

DATE: 8-18-76

OIL SHALE

09306700

RIVER WHT. RIV. RIV. ASPHALT WASH

DATE 8-3-76

TIME —

STATION 0, 15, 30, 45, 60, 75, 90, 105, 120, 125

PRE-SIEVE WT. 474.4 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	112.3	23.7	76.3
8.000	121.6	25.6	50.7
4.000	56.3	11.9	38.8
2.000	24.8	5.2	33.6
1.000	10.5	2.2	31.4
.500	5.6	1.2	30.2
.250	8.3	1.7	28.5
.125	26.1	5.5	23
.062	55.7	11.7	11.3
PAN	53.1	11.3	0
TOTAL	474.3	100	

ANALYZED BY: [illegible]

DATE: 8-18-76

UNPUBLISHED RECORDS
SUBJECT TO REVISION

#3

09306700

RIVER [illegible]

DATE 8-3-76

TIME —

STATION (15) 15, 35, 45, (55, 65) 75, 85, (95) 105

PRE-SIEVE WT. 320.0 GMS.

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	24.7	7.7	92.3
8.000	94.1	29.4	62.9
4.000	59.1	18.5	44.4
2.000	39.7	12.4	32
1.000	23.1	7.2	24.8
.500	15.0	4.7	20.1
.250	19.1	6.0	14.1
.125	18.2	5.7	8.4
.062	12.2	3.8	4.6
PAN	14.6	4.6	0
TOTAL	319.8	100	

ANALYZED BY: [illegible]

DATE: 8-18-76

OK SHALE

#4

09306700

RIVER WHT. RIV. [illegible] WASH.

DATE 8-3-76

TIME —

STATION 25, 35, 45, 75, 85, 105

PRE-SIEVE WT. 283.8 GMS. (15, 55, 65, 95 ROCK)

SIEVE SIZE M.M.	WT. RETAINED	PERCENT WT.	PERCENT FINER
64.000			
32.000			100
16.000	28.0	9.9	90.1
8.000	95.4	33.6	56.5
4.000	46.5	16.4	40.1
2.000	22.3	7.8	32.3
1.000	14.8	5.2	27.1
.500	11.9	4.2	22.9
.250	15.3	5.4	17.5
.125	17.8	6.3	11.2
.062	13.0	4.6	6.6
PAN	18.7	6.6	0
TOTAL	283.7	100	

ANALYZED BY: [illegible]

DATE: 8-18-76

OIL SHALE

WHITE RIVER E.& W. ASPHALT WASH - 09306700

BED MATERIAL

DATE 8-3-76 TIME ____ GHT. ____ TEMP. ____

STA.	< .0625	< .125	< .250	< .500	< 1.000	< 2.000	< 4.000	< 8.000	< 16.000	< 32.000	< 64.000	
0-125	16	27	31	33	34	36	40	50	77	96	100	
0-125	11	23	28	30	31	34	39	51	76	100	100	
AVG.	14	25	30	32	32	35	40	50	76	98	100	-
25-125	5	21	14	20	25	32	44	63	92	100	100	
25-125	7	11	18	23	27	32	40	56	90	100	100	
AVG.	6	9	16	22	26	32	42	60	91	100	100	

OPTIONAL FORM NO. 10
JULY 1973 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Dan Finn, WRD
Salt Lake City, Utah

DATE: January 20, 1976

FROM : B. J. Anderson, WRD
Lakewood, Colorado

Unpublished Records
Subject to Revision

SUBJECT: PROGRAMS AND PLANS--Clay mineralogy of 75UT21-53, 76UT4-9, and 76UT10-21

The tables giving the clay mineralogy are attached. The methods followed were essentially those used by Schultz. The only change was in the calculation of chlorite. The chlorite in these samples gives a higher 14Å peak at 550°C for a given amount than did the chlorite in Schultz's samples. Because of the interlayers present in the clay minerals all samples were dispersed in 0.16 percent sodium metaphosphate solution prior to the separations of the clay minerals at 4μ. The determination of montmorillonite is based on the peak produced by expansion with ethylene glycol. If the interlayer material is not removed it tends to prevent complete expansion. The result is a lowered value for montmorillonite and a corresponding higher value for mixed layer clay minerals. The mixed layer clay minerals in these samples appear to be composed primarily of illite and montmorillonite layers. Samples 76UT4-6 had been ground so fine that I could not concentrate the clays enough by gravity separation to run the clay mineralogy.

The samples from stream beds in the Uinta Formation definitely have a greater montmorillonite content than those from the White River and Evacuation Creek areas. Some bedrock samples will be useful but I have not yet found the detailed stratigraphic information I would like. If some unweathered bedrock samples that are fairly representative of the area can be obtained from the vicinity of samples sites 09306605 and 09306420 I would like to run clay mineralogy on them. The results so far indicate that the finer clay minerals are transported out of the study area.

Twelve samples of <62 μ material are being sent to Blair Jones for work on the very fine clay fraction.

B. J. Anderson

Geologist
Hydrologic Laboratory

Attachments

cc: District Chief

5013-110

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

[illegible]

oj. name & no.: Oil Shale Project #4649113

unty:

te samples received in lab: September 16, 1975

test date results needed: December 1975

SAMPLE ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

boratory mple no. ab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT10	SC			1	09306400 7-10-75	Bed Material						<2mm dia. Xh+Xc >2mm dia. L
11	SC			2	09306405 7-10-75							
12				3	09306410 7-11-75							
13				4	09306415 7-11-75							
14				5	09306430 7-7-75							
15				6	09306500 7-9-75							
16				7	09306600 7-9-75							
17				8	09306605 7-10-75							
18				9	09306610 7-10-75							
				10	09306620 7-10-75							

Person requesting analyses: Dan Finn

City & State: Salt Lake City, UT

Proj. name & no.: Oil Shale Project #4649113

County:

Date samples received in lab:

Latest date results needed: December 1975

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

Laboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	ANALYSES DESIRED AND SUPPLEMENTARY DATA REQU BY LABORATORY: HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSE 8/
76UT20	Sc-			11	7-5-75 09.306625	Stream Bed Material						< 2mm dia X6 + X > 2mm dia
21	"			12	7-5-75 09.306700	"						"

20AJ57

on Request-
Analyses: Dan Finn
: 4-30-75
rn Report USGS, WRD, 125 S. State
Rm 8002, SLC, UT 84138
st Date
lts needed: 6-30-75

U.S. Geological Survey
Water Resources Div. Ground Water Branch
HYDROLOGIC LABORATORY

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use)

State Utah
Project name: Oil Shale Proj
and No.: 4649113 00
11649-00100
Sample No's: (Lab.use)
Page 1 of 3 page

ra-y le No. .use)	Sample type 1/	Depth, ft. From # of cartons	Depth, ft. To	Field No. (if any)	Location SW Sec Twp Rge	Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permeability	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
750 [21	SC	1		1	09306400	11-13-74	Stream Bed Sample					
22		2		2	09306400	1-7-75						
23		2		3	09306405	11-13-74						
24		2		4	09306405	1-7-75						
25		1		5	09306415	11-14-74						
26		1		6	09306417	1-31-75						
27		2		7	09306420	11-14-74						
28		1		8	09306420	1-8-75						
29		2		9	09306425	11-14-74						
30		1		10	09306425	1-8-75						
31		2		11	09306430	11-12-74						
32		2		12	09306430	1-9-75						
33		1		13	09306500	11-12-74						

Other 3/: Mineral Id by X-ray diff. + clay Mineral Id; < 2 mm dia. –

ample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
P. yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits;
astic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension;
Gypsum content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility;

Forward copies 1-3 to
Copy 4 is packing list
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GPO 65000

20AJ57a

U.S. Geological Survey
Water Resources Div. Ground Water Branch
HYDROLOGIC LABORATORY

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use) _____

State Utah
Project name Oil Shale Proj.
and No. 11649-00100
Sample No's: (Lab.use) _____
Page 2 of 3 pages

Request-
Analyses: Dan Finn
: 4-30-75
urn Report USGS, WRD, 125 S State, Rm 8002, SLC, UT 84138
est Date
ults needed: 6-30-75

ora-y le No. .use)	Sample type 1/	Depth, ft. From (# of cores)	Depth, ft. To	Field No. (if any)	Location Sit Site # Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permeability	Specific yield 2/	MA Complete 2/	MA Sieve	Other 3/
IT34	SC	2		14	09306500 1-6-75	Stream Bed Sample					
35		1		15	09306600 11-14-74						X-ray
36		2		16	09306600 1-8-75						by
37		2		17	09306605 11-14-74						Mineral ID
38		2		18	09306605 1-6-75						+ Clay Mineral ID.
39		1		19	09306610 11-14-74						
40		2		20	09306610 1-9-75						
41		1		21	09306620 11-13-74						
42		2		22	09306620 1-6-75						
43		2		23	09306625 11-13-74						
44		1		24	09306625 1-6-75						
45		1		25	09306700 11-13-74						
46		1		26	09306700 1-7-75						

<2mm dia - Lithologic Description
>2mm dia - Mineral ID + Clay Mineral ID.

mple type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
ield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
alyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits;
limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension;
content; CC = Carbonate content; CA = Capillarity; AS = Acid solubility;
; FF = Formation factor.

Forward copies 1-3 to Lab.
Copy 4 is packing list
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GPO 858000

20AJ57a

Request-
analyses: Dan Finn

e: 4-30-75

urn Report USGS, WRD, 125 S. State
: Rm 8002, SLC, UT 84138

est Date
ults needed: 6-30-75

U.S. Geological Survey
Water Resourses Div. Ground Water Branch
HYDROLOGIC LABORATORY

SAMPLE-ANALYSIS REQUEST

Job. No. (Lab.use)

State Utah
Project name and No. Oil Shale Proj. 464911300 4649-00100
Sample No's: (Lab.use)
Page 3 of 3 pages

ora-ty ple No. .use)	Sample type 1/	Depth, ft. ~~From~~ # of Cartons	To	Field No. (if any)	Location	Date	Geologic Unit and Description of Sample Material	Analyses Desired: Permea-bility	Specific Yield 2/	MA Complete 2/	MA Sieve	Other 3/
UT47	SC	1		27	(D-10-25) 7c	1-14-75	Stream Bed Sample					
48	SC	1		28	(D-10-25) 7b	1-14-75						
49	SC	1		29	(D-10-24) 11a	1-14-75						
50	SC	1		30	(D-10-24) 14ab	1-14-75						
51	SC	1		31	(D-10-24) 14bb	1-14-75						
52	SC	1		32	(D 10-24) 15b	1-8-75						
53	SC	1		33	(D 10-24) 18d	1-14-75						

<2mm dia. - Mineral Id. by X-ray + Clay Mineral Id.
>2mm dia. - Lithologic Description

ample type: Cyl = Sample cylinder; SB = Sample bag; SC = Sample can; C = Core; CH = Chunks.
yield includes sp. retention and porosity; MA complete includes hydrometer and sieve anal.
analyses: MC = Moisture content; P = Porosity; AL = Atterberg limits; LL = Liquid limits;
tic limit; SL = Shrinkage limit; SG = Specific gravity; SMT = Soil moisture tension;
Capillarity; AS = Acid solubility;

Forward copies 1-3 to Lab.
Copy 4 is packing list
Retain copy 5

GPO 855000

'erson requesting analyses: Dan Finn

:ity & State: Salt Lake City, UT

'roj. name & no.: Oil Shale 76491300

:ounty:

)ate samples received in lab: 5/18/75

.atest date results needed: Sept. 15, 1975

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

ANALYSES DESIRED AND SUPPLEMENTARY DATA REQUI BY LABORATORY

.aboratory sample no. (Lab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/	C
70UT4	SB			1	Raw Oil Shale Tosco 5-6-75							Xc	
5	SB			2	Raw Oil Shale Tosco 5-6-75							Xc	
6	SB			3	Spent Oil Shale Tosco 5-6-75							Xc	
7	SB			4	Spent Oil Shale (Leached) Tosco 5-6-75							Xc	
8	SB			5	Spent Oil Shale Parachute							Xc	
9	SB			6	Stream Bottom 09306700 7-8-75							Xc	

Per cent of clay minerals

sample locality	Lab number	Chlorite	Kaolin	Illite	Mont	MLCM
09306400	75 Ut 21	0	22	25	10	43
	22	0	23	31	0	46
	76 Ut 10	0	20	60	18	2
09306405	75 Ut 23	0	10	26	0	64
	24	0	8	26	13	53
	76 Ut 11	6	3	39	7	45
09306410	76 Ut 12	5	19	16	10	50
09306415	75 Ut 25	5	20	22	0	53
	76 Ut 13	4	23	18	0	55
09306417	75 Ut 26	8	0	75	0	17
09306420	75 Ut 27	3	28	26	0	43
	28	10	15	25	9	41
09306425	29	10	0	40	0	50
	30	12	0	44	10	34
09306430	31	7	12	16	8	57
	32	10	18	22	12	38
	76 Ut 14	6	20	37	0	37
09306500	75 Ut 33	0	12	40	16	31
	34	6	20	35	12	27
	76 Ut 15	2	16	24	0	58
09306600	75 Ut 35	4	16	20	16	44
	36	6	15	24	8	47
	76 Ut 16	5	11	32	0	52
09306605	75 Ut 37	0	2	9	40	49
	38	2	0	11	52	35
	76 Ut 17	0	2	19	59	20
09306610	75 Ut 39	2	0	10	47	41
	40	2	0	13	54	31
	76 Ut 18	5	0	18	50	18
09306620	75 Ut 41	6	0	17	42	35
	42	4	0	29	48	19
	76 Ut 19	7	0	18	34	41
09306625	75 Ut 43	6	1	22	21	50
	44	4	0	24	32	40
	76 Ut 20	2	0	18	36	44
09306700	75 Ut 45	0	25	16	8	61
	46	0	23	27	0	50
	76 Ut 9	0	22	44	6	28
	21	0	8	33	0	59
D-10-25-7c	75 Ut 47	5	[illegible]	33	12	26
D-10-25-7a	48	6	25	23	15	31
D-10-24-11a	49	9	2	22	0	67
D-10-24-14ab	50	5	1	15	0	79
D-10-24-14ab	51	2	0	10	26	62
D-10-24-15b	52	2	0	9	34	55
D-10-24-16d	53	7	2	9	41	41

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Clay mineralogy determinations for samples from Oil Shale Project, 76UT4-21

Laboratory sample number	PERCENTAGE COMPOSITION OF CLAY MINERALS					Per Cent Clay minerals in total sample	PER CENT OF TOTAL SAMPLE				
	Chlorite	Kaolinite	Illite	Montmo-rillonite	Mixed layer clay minerals		Chlorite	Kaolinite	Illite	Montmo-rillonite	Mixed layer clay minerals
76UT4			Insufficient Clay Minerals			10					
5			"	"		10					
6			"	"		10					
7	0	0	100	0	0	10	0	0	10	0	0
8	0	4	75	0	21	10	0	<1	8	0	2
9	0	22	44	6	28	15	0	3	7	1	4
10	0	20	60	18	2	15	0	3	9	3	<1
11	6	3	39	7	45	15	1	<1	6	1	7
12	5	19	16	10	50	20	1	4	3	2	10
13	4	23	18	0	55	15	<1	3	3	0	8
14	6	20	37	0	37	15	1	3	6	0	6
15	2	16	24	0	58	10	<1	2	2	0	6
16	5	11	32	0	52	15	<1	2	5	0	8
17	0	2	19	59	20	15	0	<1	3	9	3
18	5	0	18	59	18	10	<1	0	2	6	2
19	7	0	18	34	41	10	<1	0	2	3	4
20	2	0	18	36	44	10	<1	0	2	4	4
21	0	8	33	0	59	10	0	<1	3	0	6

Unpublished Records
Subject to Revision

Hydrolo
Lakewoo

Clay mineralogy determinations for samples 75UT21-53

Laboratory sample number	PERCENTAGE COMPOSITION OF CLAY MINERALS					Per Cent Clay minerals in total sample	PER CENT OF TOTAL SAMPLE				
	Chlorite	Kaolinite	Illite	Montmo-rillonite	Mixed layer clay minerals		Chlorite	Kaolinite	Illite	Montmo-rillonite	Mixed layer clay minerals
75UT21	0	22	25	10	43	15	0	3	4	2	6
22	0	23	31	0	46	15	0	3	5	0	7
23	0	10	26	0	64	20	0	2	5	0	13
24	0	8	26	13	53	15	0	1	4	2	8
25	5	20	22	0	53	15	<1	3	3	0	8
26	8	0	75	0	17	20	2	0	15	0	3
27	3	28	26	0	43	15	<1	4	4	0	6
28	10	15	25	9	41	10	1	2	2	1	4
29	10	0	40	0	50	20	2	0	8	0	10
30	12	0	44	10	34	20	2	0	9	2	7
31	7	12	16	8	57	15	1	2	2	1	9
32	10	18	22	12	38	15	2	3	3	2	6
33	0	13	40	16	31	15	0	2	6	2	5
34	6	20	35	12	27	20	1	4	7	2	5
35	4	16	20	16	44	10	<1	2	2	2	4
36	6	15	24	8	47	15	1	2	4	1	7

Clay mineralogy - 75UT21-53 (concluded)

Unpublished Records
Subject to Revision

Laboratory sample number	PERCENTAGE COMPOSITION OF CLAY MINERALS					Per Cent Clay minerals in total sample	PER CENT OF TOTAL SAMPLE				
	Chlorite	Kaolinite	Illite	Montmo-rillonite	Mixed layer clay minerals		Chlorite	Kaolinite	Illite	Montmo-rillonite	Mixed layer clay minerals
75UT37	0	2	9	40	49	15	0	<1	1	6	7
38	2	0	11	52	35	10	<1	0	1	5	4
39	2	0	10	47	41	5	<1	0	<1	2	2
40	2	0	13	54	31	5	<1	0	<1	3	2
41	6	0	17	42	35	15	1	0	3	6	5
42	4	0	29	48	19	10	<1	0	3	5	2
43	6	1	22	21	50	20	1	<1	4	4	10
44	4	0	24	32	40	15	<1	0	4	5	6
45	0	25	16	8	51	15	0	4	2	1	8
46	0	23	27	0	50	10	0	2	3	0	5
47	5	24	33	12	26	15	<1	4	5	2	4
48	6	25	23	15	31	20	1	5	5	3	6
49	9	2	22	0	67	10	1	<1	2	0	7
50	5	1	15	0	79	10	<1	<1	2	0	8
51	2	0	10	26	62	10	<1	0	1	3	6
52	2	0	9	34	55	20	<1	0	2	7	11
53	7	2	9	41	41	15	1	<1	1	6	6

requesting analyses: Dan Finn

City & State: Salt Lake City, Utah

Proj. name & no.: Oil Shale 46491L300

County: Uintah

Date samples received in lab: February 27, 1976

Latest date results needed:

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

ANALYSES DESIRED AND SUPPLEMENTARY DATA REQUIRED BY LABORATORY

(Lab use)	Sample 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT25					09306400 10-7-75	Stream-Bed Material 2 cartons						<2mm dia. Xb + Xc >2mm dia. L
26					09306405 10-7-75	2 ctns						
27					09306415	2 ctns						
28					09306417 10-9-75	2 ctns						
29					09306420 10-9-75	2 ctns						
30					09306425 10-9-75	2 ctns						
31					09306430 10-7-75	2 ctns						
32					09306500 10-6-75	1 cty						
33					09306600 10-8-75	2 ctns						
34					09306605 10-8-75	2 ctns						

analyses: Dan Finn

ty & State: Salt Lake City, Utah

oj. name & no.: Oil Shale 4649111300

unty: Uintah

te samples received in lab: February 27, 1976

test date results needed:

SAMPLE-ANALYSIS REQUEST

HYDROLOGIC LABORATORY

WRD, U.S. GEOLOGICAL SURVEY

ANALYSES DESIRED AND SUPPLEMENTARY DATA REQUIRED BY LABORAT

boratory mple no. ab use)	Sample type 1/	Depth, ft. From	Depth, ft. To	Field number (if any)	Location (include well or station 15-digit site identifier based on lat.-long. number)	Geohydrologic unit 2/ & field description of sample material	Correlative information available 3/	HYDRAULIC CONDUCTIVITY(K) 4/ Flow Direction	5/ Formation Water	6/ Water Table	7/ Potentiometric Surface	OTHER ANALYSES 8/
76UT35					09306610 10-8-75	Stream-Bed Material 2 cartons						<2mm dia. XL+XC >2mm dia. LD
36					09306620 10-8-75	2 ctns						
37					09306625 10-9-75	2 ctns						
38					09306700 10-9-75	2 ctns						

Hydrologic Laboratory
Lakewood, Colorado

Mineralogy of samples 76 UT 25 - 38

Laboratory sample number	Quartz	Potassium feldspar	Plagioclase feldspar	Calcite	Dolomite	Analcime	Chlorite	Kaolinite	Illite	Montmorillonite	Mixed layer clay minerals	Total
						WEIGHT PER CENT						
76 UT 25 WHITE	53	6	5	9	7	1	0	3	3	0	5	92
26 WASH	22	5	5	14	23	3	0	7	7	0	12	98
27 EVAC	43	7	7	9	11	1	0	4	3	1	7	93
28 EVAC	10	5	8	24	17	4	1	1	4	0	13	87
29 EVAC	36	7	7	9	10	1	<1	4	2	1	7	84
30 EVAC	17	9	16	16	14	5	2	0	11	0	7	97
31 EVAC	34	8	7	12	14	2	0	4	3	0	8	92
32 WHITE	53	13	9	9	7	<1	<1	3	3	2	7	106
33 WHITE	43	6	6	10	10	2	0	2	2	1	6	88
34 SOUTHAM	23	9	19	9	≤5	11	0	<1	3	12	5	91+
35 SOUTHAM	25	≤5	19	8	≤4	7	<1	<1	2	4	4	69+
36 ASPH	22	7	17	13	7	7	1	1	4	0	14	93
37 ASPH	19	≤5	17	11	≤4	6	<1	<1	3	4	8	68+
38 WHITE	45	9	9	10	11	2	0	2	2	1	5	96

Precipitation

1974-75, 1975-76

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2									.242	.900		.780
3												
4											.872	
5								.965	.490			
6												
7												
8											1.500	
9									.620	2.260		3.750
10												
11												.247
12								1.140	.525		1.200	
13												
14											.455	
15								.525				
16										1.860		
17									1.650			
18										.295		
19								.805				
20												
21												
22								.415			2.275	
23										1.475		
24									1.040			2.200
25												
26									.850			
27								.875				
28											1.725	
[illegible]								.020		2.150		1.600
[illegible]									1.325			.100
[illegible]								.483		.435	1.170	
Tot.								5.223	6.742	9.376	9.197	8.677

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1												
2									.217	.875		.557
3												
4											1.200	
5								.640	.485			
6												
7											1.050	
8								.375				
9									.855	2.120		
10												4.100
11												
12								.875	.600		1.650	
13												
14											.360	
15								.600		1.800		.820
16									1.590			
17										.200		
18												
19								1.075	.595			
20												
21										1.100		
22								.458			1.895	
23												
24									.590	.900		2.200
25												
26									.835		1.300	
27								.925				
28										1.275		
29								.120				
30									1.325			1.290
31								.433		.740	1.393	
Tot.								5.528	7.092	9.010	8.848	8.957

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep
1							.90				.10	
2												
3									.10			
4					.10				.10			
5					.10			.20				
6								.20				
7							.10					
8									.10			
9										.10		
10						.10						
11						.20						.2
12												
13					.10						.10	
14					.10						.10	.1
15											.20	
16										.10		
17						.40	.10			.50		
18								.10				
19								.10	.10			
20												
21								.90				
22									.30			
23												
24												
25											.10	
26						.10	.40					
27						.10	.10					
28				.30				.60				
29							.10	.40				
30				.20					.20			
31						T						
Tot.				.50	.40	.90	1.70	2.50	.70	.90	.60	.3

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							.90					
2							.30					
3												
4									.10	.20		
5								.40				
6								.30				
7						.10	.10					
8									.20			
9								.10	.10			
10						.10						
11									.10			
12						.10				.10		
13												
14										.30	.10	
15												
16										.10		
17						.10				.40		
18						.10				.10		
19							.10					
20								.10				
21								.70				
22						.10						
23						.10		.10				
24												
25												
26						.10	.20					
27						.30	.10					
28				.50				.50				
29								.30				
30				T			.10					
31				.10								
Tot.				.60	N.R.	1.10	1.80	2.50	.50	1.20	.10	0

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep
1							1.20					
2		.09										
3		.02	T									
4		.02							.11			
5					.14			.65				
6												
7				.03			.17		.11			
8												
9												
10				.24	.01	.13	T					
11	*.37					.20	T					.03
12												
13			.07								.01	
14					.13						.09	
15												
16									T	.24		
17						.35						
18												
19								.05	T			
20				.01				.13				
21						T	.01	.65				
22	*.28					.22						
23	*.06	.15							T			
24	*.18											
25						T						
26						.07	.20					
27						.33	.11					
28				.54				.42				
29	*.09		.08				.02	.27				
30	.01			T						.16		
31	T		T	.28								
Tot.	**.99	.28	.15	1.10	.28	1.30	1.71	2.31	.22	.40	.10	.03

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							1.10					
2		.09										
3		.02										
4		.01							.03			
5					.09			.67				
6												
7				.02			.18		.13			
8												
9												
10				.22	.01	.15	T					
11	*.35					.13	T					.06
12												
13			.06								.01	
14					.14						.06	
15												
16									T	.14		
17						.31						
18												
19								.01	T			
20				.05				.13				
21						T	.01	.65				
22	*.26					.17						
23	*.06	.10							T			
24	*.17											
25						T						
26						.08						
27						.29	.31					
28				.54				.42				
29	*.09		.08				.01	.27				
30	T			T						.14		
31	T		T	.27		T		.05				
Tot.	**.93	.22	.14	1.10	.24	1.13	1.61	2.20	.16	.28	.07	.06

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.22					
2		.09										
3		.02	T									
4		.02							.20			
5					.14			.61				
6												
7				.01			.17		.10			
8												
9												
10				.17	.01	.32	.01					
11	*.37					.21	T					.12
12												
13			.06								.02	
14					.13						.10	
15												
16									T	.40		
17						.28						
18												
19								T	T			
20				.02				.12				
21						T	.01	.62				
22	*.28					.23						
23	*.06	.15							T			
24	*.18											
25						T						
26						.06						
27						.35	.31					
28				.54				.40				
29	*.09		.07				T	.23				
30	.01			T						.30		
31	T		T	.26		T		.05				
Tot.	**.99	.28	.13	1.00	.28	1.45	1.72	2.03	.30	.70	.12	.12

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep
1							1.04					
2		*.10										
3		*.01										
4		* T										
5					*.24			.31				
6												
7			*.09	.04			.05					
8				T								
9									.03			
10				.23		.03						
11	* .55					.22						.27
12												
13			*.11									
14					*.13							
15												
16									T			
17						.25						
18												
19								.33				
20				.05				.06				
21	* .44					T		1.00				
22	* .10					.05					.12	
23	* .23	*.07				.06		.09				
24												
25						T						
26						.04						
27						.23						
28				.58			.31	.71				
29			*.17					.35				
30	* .14			.02			T					
31	* .07		*.01	.15				.03				
Tot.	**1.53	**.18	**.38	1.07	*.37	.93	1.40	2.93	T	N.R.	** .12	.2

*Estimated **10% plus Estimate

**.51

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							.79					
2		.16	T									
3		.02										
4		.02										
5					.18			.63				
6												
7			.09	.02			.04					
8												
9									.04			
10				.20		.10						
11	*.35					.23						.37
12												
13			.06								.03	
14					.14						.20	
15												
16									T	.20		
17						.35	.06			.23		
18							.13					
19								.13	.11			
20				.34				.03				
21						.06		.79				
22	*.28					.13						
23	*.06	.16						.05				
24	*.18								.13			
25						T						
26						.03						
27						.27	.35					
28				.60				.63				
29	*.10		.14				.04	.36		T		
30	.07			T						.17		
31			T	.17		T		.05				
Tot.	**1.04	.36	.29	1.33	.33	1.16	1.41	2.67	.24	.60	.23	.37

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.00					
2		.08	T									
3		.01										
4		T										
5					.24			.83				
6												
7			.09	.02								
8												
9												
10				.17		.09						
11	* .52					.20						.63
12												
13			.10								.14	
14					.13						.30	
15												
16									T	.16		
17						.38	.05			.18		
18							.09					
19								.25	.65			
20				.08				.02				
21						.08		.76				
22	* .43					.09					.20	
23	* .10	.06						.04	.13			
24	* .22											
25						T						
26						.07						
27						.27	.22					
28				.53				.65				
29			.14					.33		T		
30	* .14			.01						.17		
31	* .07		.01	.19		T		.06				
Tot.	**1.48	.15	.34	1.00	.37	1.18	1.36	2.94	.78	.51	.64	.63

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							.92					
2		.23	T									
3		.04										
4		.03							.13			
5					.26			.82				
6												
7			.04	.02			.05		.07			
8												
9									.04			
10				.18		.07						
11	*.35					.18						.58
12												
13			.05								.03	
14					.08						.17	
15												
16									T	.26		
17						.32	.05			.32		
18							.09					
19								.31	.09			
20				.04				.03				
21						.05		.80				
22	*.26					.11						
23	*.06	.13						.04				
24	*.18								.11			
25						T						
26						.08						
27						.20	.28					
28				.57				.66				
29	*.10		.09				.03	.35		T		
30	.06			T						.16		
31			T	.16		T		.04				
Tot.	**.95	.43	.18	.97	.34	1.06	1.42	3.05	.40	.74	.20	.58

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.15					
2		.04										
3		.01										
4		T						.	.21			
5					.16			.60				
6												
7				.01			.11					
8										.13		
9									.13			
10				.18	.02	.08						
11	*.34					.18						.15
12												
13			.14								.01	
14					.12						.08	
15												
16									T	.16		
17						.38	.05			.19		
18							.08		.02			
19								.12				
20				.03								
21						.03		.11				
22	*.26					.17					.01	
23	*.06	.01						.01	.15			
24	*.17											
25						T						
26						.08						
27						.31	.31					
28				.51				.90				
29	.09		.02				.03	.32		T		
30	.04			T						.47		
31	.01		T	.28		T		T				
Tot.	**.97	.06	.16	1.01	.30	1.23	1.73	2.06	.38	.95	.10	.15

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.00	.10				
2							.20					
3									.10			
4									.10			
5					.10			.40				
6								.20				
7				T	.20		.10					
8									.10	.10		
9										.30		
10				.07		.10				.10		
11						.10			.10			.20
12						.10						
13												
14												
15					.10			.10				
16								.10	T	.10		
17						.10				.30		
18						.10	.10					
19								.10				
20				T				.10	.10			
21								.60				
22							.10	.10	.10			
23						.10		.10				
24									.10			
25												
26							.30					
27				.20		.40						
28				.30				.40				
29				T			.10	.40				
30										.40		
31				.30						.10		
Tot.				.87	.40	1.00	1.90	2.70	.70	1.40	0	.20

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.09					
2		.09										
3		.02	T									
4		.02							.20			
5					.07			.61				
6												
7				T			.13	.05				
8									.11			
9												
10				.07		.07						
11	.34					.18			.08			
12												
13			.08								.02	
14					.15							
15												
16									T	.41		
17						.20	.05			.30		
18									.01			
19								.19	.08			
20				T				.09				
21						T		.68				
22	.32					.07			.10			
23	.08	.14										
24									.10			
25						T						
26						.06						
27						.29	.34					
28				.50				.57				
29	.22		.02				.04	.47		T		
30	.06			T				.15		.42		
31	.02		T	.23								
Tot.	1.04	.27	.10	.80	.22	.87	1.65	2.81	.68	1.13	.02	0

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							1.00					
2		.03										
3		T	T									
4		T							.16			
5					.14			.66				
6												
7				T			.12	.03	.10			
8												
9										.27		
10				.17	.03	.05						
11	*.30					.14						.06
12												
13			.14								.01	
14					.07						.03	
15												
16									T	.10		
17						.26				.30		
18									.01			
19								.27	.15			
20				T				.10				
21						.01		.71				
22	*.24					.17						
23	*.06	.15						.01	.03			
24	*.15											
25						T						
26						.05						
27						.18	.34					
28				.52				.50				
29	.09		.02				.03	.33		T		
30	.04			T						.37		
31	.03		T	.26				.03				
Tot.	**.91	.18	.16	1.12	.24	.87	1.49	2.64	.43	1.04	.04	.06

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							.96					
2		.06										
3		.01	T									
4		.01							.16			
5					.21			.83				
6												
7				.01			*.10					
8												
9												
10				.17	.02	.07						
11	.32					.16						.16
12												
13			.09								.17	
14					.11							
15												
16									T	.28		
17						.40				.21		
18												
19					T			.15				
20				.01				.06				
21						.01		.84				
22	.21					.25						
23	.05	.15						.01	.20			
24	.22											
25						T						
26						.04						
27						.21	*.30					
28				.53				.55				
29	*.07		.03					.34		T		
30	.02			T						.55		
31			T	.32		T		.07				
Tot.	.89	.23	.12	1.04	.34	1.14	1.36**	2.85	.36	1.04	.17	.16

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep*
1							.90					
2							.10		.10			
3												
4					.10				.10			
5								.30	.10			
6								.30				
7				*			.10					
8					.10				.10			
9										.10		
10				*		.20						
11												.30
12												
13												
14					.10						.10	
15											.10	
16							.10			.10	.05	
17						.10				.20		
18										.10		
19								.50	.10			
20				*T				.10				
21								.70				
22						.10			.10			
23												
24				.10								
25									.10			
26						.10	.40					
27				.10		.30	.10					
28				.30				.50				
29								.40		.10		
30				.20						.40		
31						T		.10				
Tot.	N.R.	N.R.	N.R.	.70	.30	.80	1.70	2.90	.70	1.00	.25	.30

*Estimated

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1			T				1.06					
2		.07										
3		.01	T									
4		.01							.22			
5					.10			.54				
6												
7				.01			.14	.05	.08			
8												
9										.15		
10				.18	.03	.06						
11	.34					.15						.13
12												
13			.09								.02	
14					.10						.09	
15												
16									T	.21		
17						.24				.23		
18									.02			
19								.45	.06			
20				T				.11				
21						.01		.75				
22	.26					.14						
23	.06	.18						.02	.24			
24	.17											
25						T						
26						.05						
27						.25	.32					
28				.52				.55				
29	.14		.02				.03	.34		T		
30	.04			T						.54		
31	.01		T	.23		T		.04				
Tot.	1.02	.27	.11	.94	.23	.90	1.55	2.85	.62	1.13	.11	.13

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.35					
2		.09										
3		.02										
4		.02							.13			
5					.22			.62				
6												
7				.01			.16		.07			
8												
9										.17		
10				.16	.01	.18						
11	*.33					.27						.22
12												
13			.10								.01	
14					.11						.09	
15												
16									T	.25		
17						.34				.05		
18												
19								.24	.14			
20				.03				.08				
21						T	.01	.70				
22	*.26					.18					.02	
23	*.06	.20							.17			
24	*.17											
25						T						
26						.06						
27						.37	.39					
28				.54				.57				
29	*.09		.06				.01	.35		T		
30	*.06			T						.55		
31			T	.26		T		.04				
Tot.	**.97	.33	.16	1.00	.34	1.40	1.92	2.60	.51	1.02	.12	.22

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.10					
2												
3												
4									.10			
5					.13			.69				
6												
7				.02			.15		.06			
8												
9										.12		
10				.20	.01	.10						
11	*.32					.19						.01
12												
13			T								.02	
14					.11							
15												
16									T	.52		
17						.24				.17		
18												
19								.09	T			
20				.04				.09				
21						T	.01	.63				
22	*.25					.14					.01	
23	*.06	.17							.01			
24	*.17											
25						T						
26						.06						
27						.30	.32					
28				.50				.45				
29	*.09		.10				.02	.27		T		
30	.01			T						.20		
31	T		T	.28				.04				
Tot.	**.90	.17	.10	1.04	.25	1.03	1.60	2.26	.17	1.01	.03	.01

*Estimated **10% plus Estimate

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.00					
2							.10					
3							.10		.10			
4									.10			
5					.20			.20				
6					.10			.30				
7							.10					
8									.10			
9										.20		
10						.10						.10
11						.10			.10			.30
12						.10						
13											.10	
14					.10						.10	
15					.10							
16							.10			.10		
17						.40				.20		
18							.10	.10		.10	.10	
19								.20				
20								.10				
21								.70	.10			
22						.10			.60		.10	
23						.20		.20				
24												
25												
26						.10	.20					
27						.20	.10					
28				.20			.10	.50				
29				.30			.10	.30				
30				.10						.40		
31				.20						.10		
Tot.				.80	.50	1.30	2.00	2.60	1.10	1.10	.40	.40

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1							1.00					
2					.10		.10					
3									.10			
4									.10			
5					.10			.60	.10			
6												
7							.10					
8									.20			
9												
10						.10			.10			
11						.10						.30
12						.20						
13												
14											.20	
15					.10							
16										.30		
17						.10	.05			.30		
18												
19												
20								.10				
21								.60	.10			
22						.10						
23												
24									.10			
25						.10						
26							.10					
27						.30	.30					
28				.30				.40				
29							.10	.20				
30				.20						.20		
31								.10				
Tot.				.50	.30	1.00	1.75	2.00	.80	.80	.20	.30

1975-76 WATER YEAR

WATERSHEDS	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	TOTAL
ARP-1	1.50	.40	.30	.20	.40	1.00	.90	1.10	.90	.50	.40	.60	8.20
ARA-2	1.60	.30	.60	.20	.40	1.20	.60	1.50	1.30	.50	.50	.90	9.60
ARS-4	—	—	—	.10	.30	1.00	.80	1.80	1.10	.20	.30	.90	6.50*
ARA-8	—	—	—	—	.40	.80	.90	1.10	.90	.80	.70	1.30	6.90*
ARS-9	—	—	—	—	.30	1.20	1.00	1.30	1.00	.40	.50	1.00	6.70*
ARS-12	—	—	—	.10	.20	1.30	.70	1.40	.90	.60	.20	1.20	6.60*
STANDARDS													
RS-1	1.28	.32	.66	.18	.17	.41	1.09	1.19	.78	.61	.51	.61	7.81
RS-6	1.39	.33	.72	.26	.82	1.03	1.27	1.12	.64	.43	.53	1.52	10.06
RS-9	1.71	.41	.86	.33	.45	1.27	1.04	1.35	.81	.40	.51	1.07	10.21
RS-12	1.39	.35	.74	.28	.18	1.25	.72	1.16	.56	.46	.43	1.21	8.73
RS-13	1.47	.37	.66	.22	.39	1.18	.75	1.44	1.20	.47	.66	.98	9.79
RA-13	1.58	.33	.39	.29	.29	1.26	.94	1.71	.86	.36	.34	.85	9.20

* NOT A COMPLETE YEAR RECORD, GAGE SHUT DOWN FOR WINTER

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2										0.925		
3											1.030	0.775
4									0.750			
5		.211										
6										1.075	0.750	
7	1.750							.3925				0.925
8									1.200			
9										1.000		
10											1.295	0.435
11									1.075			
12								1.1225				
13										1.125	0.925	
14	1.460							.2875				0.635
15									0.800			
16										0.775		
17											1.350	0.515
18								.9760	0.520			
19												
20		.890								0.875	0.825	
21								.5750				0.719
22	1.200								1.335			
23										0.600		
24								4000			0.990	1.3250
25									0.400			
26												
27	.520									1.125	0.935	
28								.6000				.2250
29									0.975			
30										.7125		
31	.092										0.675	
Tot.	5.012	1.101						4.3535	7.0550	8.2125	8.1175	4.654

33.150

Date	10 Oct.	11 Nov.	12 Dec.	1 Jan.	2 Feb.	3 Mar.	4 Apr.	5 May	6 June	7 July	8 Aug.	9 Sept.
1												
2										0.780		
3											0.925	0.775
4		.220							0625			
5												
6	1.125									1.250	0.750	
7								0.5425				0.970
8									1.125			
9										0.950		
10											1.300	0.450
11									1.050			
12								0.8188				
13										1.075	0.775	
14	1.560							.3138				0.670
15									0.850			
16										0.875		
17	.400										1.225	0.495
18								.9125	0.510			
19												
20		.840								0.870	0.675	
21	.550							.5625				0.800
22									0.965			
23										0.775		
24								.4063			1.040	
25									0.773			.2250
26												
27										0.950	0.735	
28								.6125				
29	.605								1.025			.4501
30										0.8253		
31	.110										1.025	
Tot.	4.350							4.1731	6.423	8.350	[illegible]	4.815

STATION: ATT-1 AUTO YEAR TOTAL 8.20 SEASON TOTAL 75-76

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				.10		.10				.10		
2						.40						
3											.10	
4						.30						
5												
6				.10	.10			.30				.10
7												
8	.10							.40			.20	
9												
10	.10	.10										
11						.10						.20
12						.10						
13									.20			.10
14			.30				.20					
15												
16		.10					.20					
17					.10		.20			.10		
18							.10		.10	.10		
19							.10					
20					.20					.10		
21								.10				.10
22								.20	.60			
23	.20										.10	
24	.30							.10				
25	.10											.10
26							.10					
27												
28												
29	.10	.20										
30												
31	.60									.10		
Tot.	1.30	.40	.30	.20	.40	1.00	.90	1.10	.90	.50	.40	.60

STATION ARA 2 AUTO — YEAR TOTAL 9.60 — SEASON TOTAL 75-76

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						.10				.10		
2						.50					.30	
3												
4						.30						
5				.20								
6					.20			.40				.10
7								.10				.10
8	.10							.50			.10	
9												
10												
11						.20						
12												.10
13												.10
14							.10		.10			
15									.10			
16							.10					
17							.10		.10	.10		
18							.10			.10		
19										.10		
20		.10			.20			.10				
21								.10		.10		.20
22								.20	1.00		.10	
23	.50											
24	.20					.10						.20
25												.10
26							.10					
27							.10					
28												
29		.20										
30												
31	.80							.10				
Tot.	1.60	.30	.60	.20	.40	1.20	.60	1.50	1.30	.50	.50	.70

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0.1						
2						0.4						
3						0.1		0.1			.10	
4						0.3						
5				E 0.1			0.1				.10	
6					0.1			0.3				.10*
7								0.5				.10*
8								0.4			.10	
9												
10												.20*
11						0.1						
12												.10*
13									0.2			
14												
15							0.1					.10*
16							0.1					
17							0.2		0.1			
18							0.1			.10		
19												
20					0.2					.10		
21								0.2				.10*
22								0.1	0.8			
23								0.1				
24												.10*
25												
26							0.1					
27												.10*
28							0.1	0.1				
29												
30												
31												
Tot.	—	—	—	E 0.1	0.3	1.0	0.8	1.8	1.1	.20	.10	.90

* EGG MOVED FROM ARS-4 TO ARA-13

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0.3				0.1		
2						0.1						
3						0.1					.40	
4						0.1						
5						0.1						
6					0.1			0.4				.40
7												
8								0.4			.20	
9					0.1							
10												
11						0.1		0.1				
12												.10
13									0.2			
14							0.1					.20
15												
16							0.1		0.1			
17							0.2					
18							0.2		0.1	0.20		
19					0.2							
20										.20		
21												
22								0.2	0.5			.10
23							0.1					.10
24											.10	
25						0.1				.20		.40
26							0.2			.10		
27												
28												
29												
30												
31												
Tot.	—	—	—	—	0.4	0.8	0.9	1.1	0.9	0.80	.70	1.30

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0.10						
2						0.50						
3											.20	
4						0.30						
5						0.10					.10	
6								0.40				
7								0.10				
8								0.30			.10	
9												
10												
11						0.20						.25
12												.10
13									0.20			
14							0.10					.10
15												
16							0.10					.10
17							0.30			.10		
18							0.20		0.10	.10		
19												
20					0.30			0.10		.10		
21								0.10		.10		
22								0.20	0.70		.10	.10
23												.10
24												
25							0.10					.30
26							0.20					
27												
28												
29								0.10				
30												
31												
Tot.	—	—	—	—	0.30	1.20	1.00	1.30	1.00	.40	.70	1.00

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0.4				0.1		
2						0.3						
3						0.4						
4												
5				E 0.1			0.2				.10	
6					0.1			0.4				.40
7												
8								0.3				
9												
10												.10
11						0.2						.20
12										0.10		
13									0.2			.10
14							0.1					
15												
16							0.1					
17					0.1		0.1			.10		
18							0.1					
19										0.10		.10
20								0.2				
21								0.2				
22								0.1	0.6		.10	
23								0.1				.30
24												
25												
26							0.1					
27												
28										.10		
29												
30												
31								0.1	0.1	.10		
Tot.	—	—	—	0.1	0.2	1.3	0.7	1.4	0.9	0.60	.20	1.20

STATION RP-1 STANDARD

SEASON TOTAL 75-76

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					INSTALLED					.09		
2							.05				.21	
3						.43		.05				
4												
5												
6					.07							.12
7												
8											.19	
9												
10								.30				
11												
12												.20
13						.43						
14												.07
15												
16												
17					.09							
18												
19										.27		
20					.20							
21												
22									.60		.04	
23												.14
24												
25												
26								.37				
27							.87					.12
28												
29												
30												
31								.29				
Tot.					.36	.86	.92	1.01	.60	.36	.44	.65

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2												
3											.16	
4												
5				.18								
6												
7					.17							
8												
9											.30	.25
10												
11												
12												
13	.02							.68				
14												.17
15			.66				.14					
16												
17									.27			
18											0	
19		.04					.63					
20										.57		
21												
22									.51			.06
23	.54											
24												
25								.38				
26												
27	.11						.32					
28												.13
29		.28				.41				.04		
30												
31	.61							.13			.05	
Tot.	1.28	.32	.66	.18	.17	.41	1.09	1.19	.78	.61	.51	.61

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					(INSTALLED)					.11		
2							.07				.43	
3						.57						
4												
5												
6					.10							.20
7												
8											.12	
9												
10								.81				.01
11												
12												~~.20~~
13												
14						.50						.07
15												.04
16												
17					.06							
18												
19					.19					.25		
20												
21												
22									.96		.09	
23												.19
24												
25												
26								.36				
27							.58					.24
28												
29												
30												
31								.06				
Tot.	—	—	—	—	.35	1.07	.65	1.23	.96	.36	.64	.89

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2												
3												
4												
5				.20								
6												
7												
8	.14											
9												
10												
11		.01										
12												
13	.03											
14												
15												
16			.56									
17												
18												
19												
20		.04										
21												
22												
23	.41											
24												
25												
26												
27	.09											
28												
29		.30										
30												
31	.66											
Tot.	1.33	.35	.56	.20	—	—	—	—	—	—	—	—

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										.01		
2							.07				.19	
3						.64		.03				
4												
5												
6				E .20	.10							
7												
8												
9												.91
10												
11												
12												.10
13						.62						
14												.07
15												
16												
17					.02							
18												
19										.17		
20					.21							
21												
22									1.08			
23												.18
24												
25												
26								.39				
27							.72					.08
28												
29												
30												
31			.29									
Tot.			.29	E .20	.33	1.26	.79	.42	1.08	.18	.19	1.34

STATION RS-6 STANDARD SEASON TOTAL 75-76

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2												
3						.34					.30	
4												
5				.26								
6												
7					.21		.04					
8	.14					.45						
9											.18	.57
10								.72				
11												
12						.21						
13	.05								.20			
14												
15			.72				.17					.21
16												
17												
18												
19		.04					.76			.16		
20										.02		
21								.11				
22								.07				.17
23	.50				.61				.44			
24												
25												
26												.57
27	.08						.30					
28								.22				
29		.29				.03				.25		
30											.05	
31	.62											
Tot.	1.39	.33	.72	.26	.82	1.03	1.27	1.12	.64	0.43	.53	1.52

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2						.26						
3											.33	
4												
5				E .20								
6												
7					.07		.03					
8						.39						
9											.29	.34
10								.73				
11												
12						.20						
13												
14									.23			
15							.10					.31
16												
17												
18												
19							.58			.24		
20										.15		
21								.03				
22								.26	.50			.14
23					.29							
24												
25												
26												.23
27							.31					
28								.14		.22		
29						.05						
30											.13	
31								.10				
Tot.				E .20	0.36	.90	1.02	1.26	.73	.61	.75	1.02

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										.05		
2							.04				.15	
3						.67						
4												
5				.33								
6					.10							.05
7												
8	.17										.36	
9												
10								.82				
11		.01										
12												.26
13	.04					.60						
14												.11
15												.10
16			.86									
17					.04							
18												
19		.04								.35		
20					.31							
21												
22									.81		.08	
23	.66											.24
24												
25		.11										
26								.45				
27	.15						1.00					.31
28												
29		.25										
30												
31	.69							.08				
Tot.	1.71	.41	.86	.33	.45	1.27	1.04	1.35	.81	.40	.51	1.07

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										.17		
2							.07				.22	
3												
4												
5				.28								
6					.11							.40
7												
8	.13										.11	
9						1.02						
10								.62				
11												
12										.08		.12
13	.03											
14						.23						.26
15												
16			.74									
17					.07							
18												
19		.04								.21		
20												
21												
22									.56		.10	
23	.55											.16
24												
25		.12										
26								.48				
27	.05						.65					.27
28												
29		.19										
30												
31	.63							.06				
Tot.	1.39	0.35	.74	.28	.18	1.25	.72	1.16	.56	.46	.43	1.21

STATION [illegible]

SEASON TOTAL 75-76

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										.24		
2							.03				.24	
3						.60		.03				
4												
5												
6				.22	.10							.36
7												
8	.13										.28	
9												
10								.97				
11												
12												.10
13	.03					.58						
14												.23
15												
16			.66									
17					.07							
18												
19		.06								.23		
20					.22							
21												
22									1.20		.09	
23	.58											.20
24												
25		.09										
26								.39				
27	.07						.72					.09
28												
29		.22										
30												
31	.66							.05				
Tot.	1.47	.37	.66	.22	.39	1.18	.75	1.44	1.20	.47	.65	.98

Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										.10		
2							.05				.13	
3						.65		.02				
4												
5				.29								
6					.10							SEE AUTO
7												.20
8	.16										.16	
9												
10								1.11				
11												
12												.28
13	.04					.61						
14												.08
15												
16			.39									
17					.02							
18												
19		.04								.26		
20					.17							
21												
22									.86		.05	
23	.60											.20
24												
25												
26								.54				
27	.16						.59					.09
28												
29		.29										
30												
31	.02							.04				
Tot.	1.58	.33	.39	.29	.29	1.26	.94	1.71	.86	.36	.34	.85

Water Quality Analysis

Precipitation Stations

PWS-1, PWS-2, PWS-3

GEOLOGICAL SURVEY
CENTRAL LABORATORY, ATLANTA, GEORGIA

WATER QUALITY ANALYSIS
LAB ID # 153152 RECORD # 49368

Unpublished Records
Subject to Revision

SAMPLE LOCATION: NO NAME
STATION ID: AWS-/ ~~9999999~~ LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--750508 END-- TIME--0805
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: SURFACE WATER GEOLOGIC UNIT:
COMMENTS:
RAINFALL .4 SAMPLES THAT REQUIRED CHILLING WERE DISCARDED BECAUSE OF TIME LAG

ALK.TOT (AS CACO3)	MG/L	5	MAGNESIUM DISS	MG/L	0.1
ALUMINUM DISSOLVED	UG/L	40	MANGANESE DISSOLVED	UG/L	0
ARSENIC DISSOLVED	UG/L	0	MERCURY DISSOLVED	UG/L	0.2
BARIUM DISSOLVED	UG/L	100	MOLYBDENUM DISSOLVED	UG/L	0
BERYLLIUM DISSOLVED	UG/L	0	NICKEL DISSOLVED	UG/L	0
BICARBONATE	MG/L	6	POTASSIUM DISS	MG/L	0.2
BORON DISSOLVED	UG/L	40	RESIDUE DIS CALC SUM	MG/L	153
BROMIDE	MG/L	0.0	RESIDUE DIS TON/AFT		0.23
CADMIUM DISSOLVED	UG/L	0	RESIDUE DIS 180C	DETP. DELETED	
CALCIUM DISS	MG/L	0.0	SAR		0.2
CARBON DIS ORGANIC	MG/L	2.6	SELENIUM DISSOLVED	UG/L	0
CARBON ORG SUS	MG/L	0.1	SILICA DISSOLVED	MG/L	2.2
CHLORIDE DISS	MG/L	1.5	SODIUM DISS	MG/L	0.3
CHROMIUM DISSOLVED	UG/L	0	SODIUM PERCENT		43
COPPER DISSOLVED	UG/L	1	SP. CONDUCTANCE LAB		9
FLUORIDE DISS	MG/L	0.3	STRONTIUM DISSOLVED	UG/L	38
HARDNESS NONCARB	MG/L	0	SULFATE DISS	MG/L	150
HARDNESS TOTAL	MG/L	1	SULFIDE DISSOLVED	MG/L	0.0
IRON DISSOLVED	UG/L	0	TURBIDITY (JTU)		1
LEAD DISSOLVED	UG/L	0	VANADIUM DISSOLVED	UG/L	0.2
LITHIUM DISSOLVED	UG/L	0	ZINC DISSOLVED	UG/L	0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	0.0	0.000	BICARBONATE	6	0.099
MAGNESIUM DISS	0.1	0.009	CHLORIDE DISS	1.5	0.043
POTASSIUM DISS	0.2	0.006	FLUORIDE DISS	0.3	0.016
SODIUM DISS	0.3	0.014	SULFATE DISS	150	3.332
TOTAL		0.026	TOTAL		3.488

PERCENT DIFFERENCE = -98.50

MAIL TO SALT LAKE CITY. UT
SCHEDULES USED: 289 0 0 0
NUMBER OF DETERMINATIONS: 35 HCODE = 17
COST OF ANALYSIS $ 178.70 DOP--760803
SUBMIT CORRECTIONS TO CENTRAL LAB WITHIN
15 DAYS FROM BELOW STAMPED DATE. INDICATE
CENTRAL LAB ID # AND RECORD # WITH RESPONSE.
WRD-ON FILE STORAGE REQUESTED. THE CENTRAL LAB
ATTEMPTED TO SUPPLY HEADING INFORMATION TO THE
STATION HEADER FILE. PLEASE CHECK OUR ATTEMPT.

[illegible] that some of these
[illegible] WERE RERUN.

[illegible] on your
own terminal.

PARAMETERS RERUN

DATE _____

Ca _____ HCO_3 _____

Mg _____ CO_3 _____

Na _____ SO_4 160

K _____ Cl _____

pH of Fe sample 2.6

KX10^6 of Fe Sample. 1110

Sample seems to be
Contaminated with
H_2SO_4

Ru pH - 6.4
KX10^6 - 12

QUALITY CONTROL INFORMATION FOR LAB ID # 153152 RECORD # 49363

*THIS CONSTITUENT HAS BEEN REPORTED AS <= TO 0, LOOK AT-- CALCIUM DISS VALUE = 0.000
*CATION/.01(CONDUCTANCE) RATIO IS EITHER BELOW 0.92 OR ABOVE 1.24---------RATIO VALUE = 0.293
*CALCULATED SOLIDS/CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.81---RATIO VALUE = 18.666
*THE PERCENT DIFFERENCE COMPUTED FOR THE ANALYSIS DOES NOT AGREE WITH THE CURVE VALUE = 4.155
:SIDUE DIS 180C WAS DELETED BECAUSE: IMPROPER SAMPLE.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Record
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 135015 RECORD # 15003

SAMPLE LOCATION: NO INFORMATION IN THE STATION HEADER FILE.
STATION ID: NO.PWS-1 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--0810
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
PWS-1 IS AT STATION S-12 (09306625). RAINFALL= 0.4".

ALUMINUM DISSOLVED	DETR. DELETED	LEAD DISSOLVED	DETR. DELETED
BARIUM DISSOLVED	DETR. DELETED	LITHIUM DISSOLVED	DETR. DELETED
BERYLLIUM DISSOLVED	DETR. DELETED	MANGANESE DISSOLVED	DETR. DELETED
BISMUTH DISSOLVED	DETR. DELETED	MOLYBDENUM DISSOLVED	DETR. DELETED
BORON DISSOLVED	DETR. DELETED	NICKEL DISSOLVED	DETR. DELETED
CADMIUM DISSOLVED	DETR. DELETED	SILVER DISSOLVED	DETR. DELETED
CHROMIUM DISSOLVED	DETR. DELETED	STRONTIUM DISSOLVED	DETR. DELETED
COBALT DISSOLVED	DETR. DELETED	TIN DISSOLVED	DETR. DELETED
COPPER DISSOLVED	DETR. DELETED	TITANIUM DISSOLVED	DETR. DELETED
GALLIUM DISSOLVED	DETR. DELETED	VANADIUM DISSOLVED	DETR. DELETED
GERMANIUM DISSOLVED	DETR. DELETED	ZINC DISSOLVED	DETR. DELETED
IRON DISSOLVED	DETR. DELETED	ZIRCONIUM DISSOLVED	DETR. DELETED

Insufficient amount of sample. Dissolved solids too low.

Unpublished Records
Subject to Revision

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

WATER QUALITY ANALYSIS
LAB ID # 135014 RECORD # 16001

SAMPLE LOCATION: NO INFORMATION IN THE STATION HEADER FILE.
STATION ID: NO.PWS-1 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--0815
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
PWS-1 IS AT STATION S-12 (09306625). RAINFALL= 0.4".

GROS-A,D,U-NAT UG/L	0.6	GROS-B,D,SR-90-PCI/L	0.8
GROS-B,D,CS137 PCI/L	0.9	POTASSIUM 40,D,PCI/L	0.1
		RESIDUE TOT FIL 105C MG/L	3

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, ATLANTA, GEORGIA

WATER QUALITY ANALYSIS
LAB ID # 208058 RECORD # 1599

Unpublished Records
Subject to Revision

SAMPLE LOCATION: NO NAME
STATION ID: 99999999 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1345
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
COLL BY LARK VTN PRECIP STA RP-1

ALK,TOT (AS CACO3)	MG/L	16	NICKEL DISSOLVED	UG/L	5
ALUMINUM DISSOLVED	UG/L	10	NITR. NH4 AS NH4 DIS	MG/L	0.82
ARSENIC DISSOLVED	UG/L	2	NITR. NO2 AS NO2 DIS	MG/L	0.03
BARIUM DISSOLVED	UG/L	~~200~~ 100 *	NITR. NO3 AS NO3 DIS	MG/L	2.6
BERYLLIUM DISSOLVED	UG/L	20	NITROGEN NH4 ASN DIS	MG/L	0.64
BICARBONATE	MG/L	20	NITROGEN NO2 ASN DIS	MG/L	0.01
BORON DISSOLVED	UG/L	0	NITROGEN NO3 ASN DIS	MG/L	0.59
BROMIDE	MG/L	0.0	NITROGEN TOTKJD AS N	MG/L	1.6
CADMIUM DISSOLVED	UG/L	0	NO2+NO3 AS N DISS	MG/L	0.60
CALCIUM DISS	MG/L	5.1	OIL AND GREASE	MG/L	0.0
CARBON DIS ORGANIC	MG/L	4.6	PH FIELD		4.5
CARBON ORG SUS	DETR.	DELETED	PHENOLS	UG/L	12
CARBONATE	MG/L	0	PHOS ORTHO DIS AS P	MG/L	0.00
CHLORIDE DISS	MG/L	1.5	PHOSPHATE DIS ORTHO	MG/L	0.00
CHROMIUM DISSOLVED	UG/L	0	PHOSPHORUS TOT AS P	MG/L	0.07
COD HI LEVEL	MG/L	8	POTASSIUM DISS	MG/L	0.7
COLOR		0	RESIDUE DIS CALC SUM	MG/L	28
COPPER DISSOLVED	UG/L	11	RESIDUE DIS TON/AFT		0.01
CYANIDE	MG/L	0.00	RESIDUE DIS 180C	MG/L	10
DETERGENTS (MBAS)	MG/L	0.0	SAR		0.3
FLUORIDE DISS	MG/L	0.1	SELENIUM DISSOLVED	UG/L	1
HARDNESS NONCARB	MG/L	0	SILICA DISSOLVED	MG/L	0.5
HARDNESS TOTAL	MG/L	13	SODIUM DISS	MG/L	2.2
IRON DISSOLVED	UG/L	10	SODIUM PERCENT		25
LEAD DISSOLVED	UG/L	2	SP. CONDUCTANCE LAB		54
LITHIUM DISSOLVED	UG/L	0	STRONTIUM DISSOLVED	UG/L	160
MAGNESIUM DISS	MG/L	0.1	SULFATE DISS	MG/L	3.7
MANGANESE DISSOLVED	UG/L	0	SULFIDE DISSOLVED	MG/L	0.0
MERCURY DISSOLVED	UG/L	0.2	TURBIDITY (JTU)		75
MOLYBDENUM DISSOLVED	UG/L	0	VANADIUM DISSOLVED	UG/L	1.3
			ZINC DISSOLVED	UG/L	10

CONTINUED ON NEXT PAGE

* Corrected by Central Lab. BWF

MAIL TO SALT LAKE, UT BCODE: 49
SCHEDULES USED: 289 0 0 0
NUMBER OF DETERMINATIONS: 49 HCODE = 17
COST OF ANALYSIS $ 249.52 DOP--760914
SUBMIT CORRECTIONS TO CENTRAL LAB WITHIN
15 DAYS FROM BELOW STAMPED DATE. INDICATE
CENTRAL LAB ID # AND RECORD # WITH RESPONSE.
WRD-QW FILE STORAGE REQUESTED. THE CENTRAL LAB
ATTEMPTED TO SUPPLY HEADING INFORMATION TO THE
STATION HEADER FILE. PLEASE CHECK OUR ATTEMPT.

SEP 20 1976

Unpublished Records
Subject to Revision

SEP 14 1976
DATE

Ca X 5.0 HCO3 X Fm 20
Mg X 0.1 CO3
Na X 2.2 SO4
K X 0.7 Cl
K X 10⁶ Fm 51

Please notice that some of these PARAMETERS HAVE BEEN RERUN.

Consider these values when reviewing the analysis which you may have retrieved on your own terminal.

WATER QUALITY ANALYSIS CONTINUED
LAB ID # 208058 RECORD # 1599

SAMPLE LOCATION: NO NAME
STATION ID: 99999999 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1345

CATIONS	(MG/L)	(MEQ/L)	ANIONS	(MG/L)	(MEQ/L)
CALCIUM DISS	5.1	0.255	BICARBONATE	20	0.328
MAGNESIUM DISS	0.1	0.009	CARBONATE	0	0.000
POTASSIUM DISS	0.7	0.018	CHLORIDE DISS	1.5	0.043
SODIUM DISS	2.2	0.096	FLUORIDE DISS	0.1	0.006
			SULFATE DISS	3.7	0.078
			NO2+NO3 AS N D	0.60	0.043
TOTAL		0.376	TOTAL		0.495

PERCENT DIFFERENCE = -13.65

Unpublished Records
Subject to Revision

QUALITY CONTROL INFORMATION FOR LAB ID # 208058 RECORD # 1599

*CATION/.01(CONDUCTANCE) RATIO IS EITHER BELOW 0.92 OR ABOVE 1.24----------RATIO VALUE = 0.696
*ANION/.01(CONDUCTANCE) RATIO IS EITHER BELOW 0.92 OR ABOVE 1.24----------RATIO VALUE = 0.917
*CALCULATED SOLIDS/CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.81---RATIO VALUE = 0.518
*THE ROE (LC 27) /CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.86---RATIO VALUE = 0.185
*ROE(LC 27)/CALCULATED SOLIDS RATIO IS EITHER BELOW 0.90 OR ABOVE 1.12----RATIO VALUE = 0.357
*THE PERCENT DIFFERENCE COMPUTED FOR THE ANALYSIS DOES NOT AGREE WITH THE CURVE VALUE = 12.780
ARBON ORG SUS WAS DELETED BECAUSE: IMPROPER SAMPLE.

Unpublished Records
Subject to Revision

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Records
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 209056 RECORD # 23488

SAMPLE LOCATION: NO INFORMATION IN STATION HEADER FILE
STATION ID: LAB ID 209056 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1350
STATE CODE: 49 COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
COLL BY LARK PROCESSED 7/21 VTN PRECIP STA RP-1

ALUMINUM DISSOLVED	UG/L		30	MANGANESE DISSOLVED	UG/L		10
BARIUM DISSOLVED	UG/L		50	MOLYBDENUM DISSOLVED	UG/L		1
BERYLLIUM DISSOLVED	UG/L	<	0	NICKEL DISSOLVED	UG/L		1
BISMUTH DISSOLVED	UG/L	<	1	PH FIELD--			4.5
BORON DISSOLVED	UG/L		10	SILVER DISSOLVED	UG/L	<	0
CHROMIUM DISSOLVED	UG/L	<	1	STRONTIUM DISSOLVED	UG/L		50
COBALT DISSOLVED	UG/L	<	1	TIN DISSOLVED	UG/L	<	1
COPPER DISSOLVED	UG/L		8	TITANIUM DISSOLVED	UG/L		1
GALLIUM DISSOLVED	UG/L	<	0	UNDEFINED CODE 642			1
GERMANIUM DISSOLVED	UG/L	<	1	UNDEFINED CODE 647			0
IRON DISSOLVED	UG/L		20	UNDEFINED CODE 654			10
LEAD DISSOLVED	UG/L		1	VANADIUM DISSOLVED	UG/L		1.0
				ZIRCONIUM DISSOLVED	UG/L	<	2

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Records
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 209061 RECORD # 23498

SAMPLE LOCATION: NO INFORMATION IN STATION HEADER FILE
STATION ID: LAB ID 209061 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1355
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
COLL BY LARK PROCESSED 7/21, VTN PRECIP STA RP-1, 1F GROSS A>4PC/L
DO 466 -1 470, 1F GROSS B>100 PC/6 DO 461 & 467

GROS-A;D,U-NAT	UG/L	0.6	PH FIELD		4.5
GROS-B,D,CS137	PCI/L	2.9	POTASSIUM DISS	MG/L	0.5
GROS-B,D,SR-90-PCI/L		2.5	POTASSIUM 40,D.PCI/L		0.4
			RESIDUE TOT FIL 105C	MG/L	18

CATIONS	(MG/L)	(MEQ/L)	ANIONS	(MG/L)	(MEQ/L)
POTASSIUM DISS	0.5	0.013			
TOTAL		0.013	TOTAL		

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, ATLANTA, GEORGIA

WATER QUALITY ANALYSIS
LAB ID # 153153 RECORD = 49371

Unpublished Records
Subject to Revision

SAMPLE LOCATION: NO NAME
STATION ID: PWS-2 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: P SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
RAINFALL .4 SAMPLES THAT REQUIRED CHILLING WERE DISCARDED BECAUSE OF TIME LAG

ALK.TOT (AS CACO3)	MG/L	0	MAGNESIUM DISS	MG/L	0.2
ALUMINUM DISSOLVED	UG/L	50	MANGANESE DISSOLVED	UG/L	0
ARSENIC DISSOLVED	UG/L	0	MERCURY DISSOLVED	UG/L	0.2
BARIUM DISSOLVED	UG/L	0	MOLYBDENUM DISSOLVED	UG/L	0
BERYLLIUM DISSOLVED	UG/L	20	NICKEL DISSOLVED	UG/L	0
BICARBONATE	MG/L	0	POTASSIUM DISS	MG/L	0.2
BORON DISSOLVED	UG/L	20	RESIDUE DIS CALC SUM	MG/L	6
BROMIDE	MG/L	0.0	RESIDUE DIS TON/AFT		0.03
CADMIUM DISSOLVED	UG/L	0	RESIDUE DIS 180C	MG/L	24
CALCIUM DISS	MG/L	1.4	SAR		0.1
CARBON DIS ORGANIC	MG/L	2.0	SELENIUM DISSOLVED	UG/L	0
CARBON ORG SUS	MG/L	0.1	SILICA DISSOLVED	MG/L	0.0
CHLORIDE DISS	MG/L	0.1	SODIUM DISS	MG/L	0.4
CHROMIUM DISSOLVED	UG/L	0	SODIUM PERCENT		15
COPPER DISSOLVED	UG/L	3	SP. CONDUCTANCE LAB		153
FLUORIDE DISS	MG/L	0.2	STRONTIUM DISSOLVED	UG/L	30
HARDNESS NONCARB	MG/L	4	SULFATE DISS	MG/L	3.7
HARDNESS TOTAL	MG/L	4	SULFIDE DISSOLVED	MG/L	0.0
IRON DISSOLVED	UG/L	20	TURBIDITY (JTU)		4
LEAD DISSOLVED	UG/L	0	VANADIUM DISSOLVED	UG/L	1.0
LITHIUM DISSOLVED	UG/L	0	ZINC DISSOLVED	UG/L	0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	1.4	0.070	BICARBONATE	0	0.000
MAGNESIUM DISS	0.2	0.017	CHLORIDE DISS	0.1	0.003
POTASSIUM DISS	0.2	0.005	FLUORIDE DISS	0.2	0.011
SODIUM DISS	0.4	0.018	SULFATE DISS	3.7	0.078
TOTAL		0.109	TOTAL		0.090

PERCENT DIFFERENCE = 9.26

MAIL TO SALT LAKE CITY, UT
SCHEDULES USED: 289 0 0 0
NUMBER OF DETERMINATIONS: 35 HCODE = 17
COST OF ANALYSIS $ 184.18 DOP--760803
SUBMIT CORRECTIONS TO CENTRAL LAB WITHIN
15 DAYS FROM BELOW STAMPED DATE. INDICATE
CENTRAL LAB ID # AND RECORD # WITH RESPONSE.
WRD-ONLY FILE STORAGE REQUESTED. THE CENTRAL LAB
ATTEMPTED TO SUPPLY HEADING INFORMATION TO THE
STATION HEADER FILE. PLEASE CHECK OUR ATTEMPT.

AUG 09 1976

PARAMETERS RERUN

DATE 7/28

Ca _____ HCO_3 _____

Mg _____ CO_3 _____

Na _____ SO_4 _____

K _____ Cl _____

Rec 6 wtr/H_2O

_____ _____

Please notice that some of these
PARAMETERS HAVE BEEN RERUN.

[illegible]
[illegible] which
[illegible] received on your
[illegible]

QUALITY CONTROL INFORMATION FOR LAB ID # 153153 RECORD # 49371

THIS CONSTITUENT HAS BEEN REPORTED AS <= TO 0. LOOK AT-- BICARBONATE VALUE = 0.000
THIS CONSTITUENT HAS BEEN REPORTED AS <= TO 0. LOOK AT-- SILICA DISSOLVED VALUE = 0.000
CATION/.01(CONDUCTANCE) RATIO IS EITHER BELOW 0.92 OR ABOVE 1.24---------RATIO VALUE = 0.071
CALCULATED SOLIDS/CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.81---RATIO VALUE = 0.039
THE ROE (LC 27) /CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.86---RATIO VALUE = 0.156
ROE(LC 27)/CALCULATED SOLIDS RATIO IS EITHER BELOW 0.90 OR ABOVE 1.12---RATIO VALUE = 4.000

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Records
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 135017 RECORD # 15007

SAMPLE LOCATION: NO INFORMATION IN THE STATION HEADER FILE.
STATION ID: NO.PWS-2 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--0915
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
PWS-2 IS AT THE RETORT SITE. RAINFALL = 0.4".

ALUMINUM DISSOLVED	DETR. DELETED	LEAD DISSOLVED	DETR. DELETED
BARIUM DISSOLVED	DETR. DELETED	LITHIUM DISSOLVED	DETR. DELETED
BERYLLIUM DISSOLVED	DETR. DELETED	MANGANESE DISSOLVED	DETR. DELETED
BISMUTH DISSOLVED	DETR. DELETED	MOLYBDENUM DISSOLVED	DETR. DELETED
BORON DISSOLVED	DETR. DELETED	NICKEL DISSOLVED	DETR. DELETED
CADMIUM DISSOLVED	DETR. DELETED	SILVER DISSOLVED	DETR. DELETED
CHROMIUM DISSOLVED	DETR. DELETED	STRONTIUM DISSOLVED	DETR. DELETED
COBALT DISSOLVED	DETR. DELETED	TIN DISSOLVED	DETR. DELETED
COPPER DISSOLVED	DETR. DELETED	TITANIUM DISSOLVED	DETR. DELETED
GALLIUM DISSOLVED	DETR. DELETED	VANADIUM DISSOLVED	DETR. DELETED
GERMANIUM DISSOLVED	DETR. DELETED	ZINC DISSOLVED	DETR. DELETED
IRON DISSOLVED	DETR. DELETED	ZIRCONIUM DISSOLVED	DETR. DELETED

Insufficient amount of sample. Dissolved solids too low.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Records
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 135016 RECORD # 15005

SAMPLE LOCATION: NO INFORMATION IN THE STATION HEADER FILE.
STATION ID: NO.PWS-2 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--0920
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
PWS-2 IS AT THE RETORT SITE. RAINFALL = 0.4".

GROS-A,D,U-NAT UG/L	0.5	GROS-B,D,SR-90-PCI/L	3.4
GROS-B,D,CS137 PCI/L	3.8	POTASSIUM 40,D,PCI/L	0.2
		RESIDUE TOT FIL 105C MG/L	8

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, ATLANTA, GEORGIA

WATER QUALITY ANALYSIS
LAB ID # 208060 RECORD # 1605

Unpublished Records
Subject to Revision

SAMPLE LOCATION: NO NAME
STATION ID: 99999999 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1320
STATE CODE: 49 COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
COLL BY LARK VTN PRECIP STA RETORT SITE

ALK,TOT (AS CACO3)	MG/L	7
ALUMINUM DISSOLVED	UG/L	20
ARSENIC DISSOLVED	UG/L	1
BARIUM DISSOLVED	UG/L	0
BERYLLIUM DISSOLVED	UG/L	10
BICARBONATE	MG/L	9
BORON DISSOLVED	UG/L	60
BROMIDE	MG/L	0.0
CADMIUM DISSOLVED	UG/L	0
CALCIUM DISS	MG/L	3.6
CARBON DIS ORGANIC	MG/L	11
CARBON ORG SUS		DETR. DELETED
CARBONATE	MG/L	0
CHLORIDE DISS	MG/L	0.6
CHROMIUM DISSOLVED	UG/L	0
COD HI LEVEL	MG/L	19
COLOR		0
COPPER DISSOLVED	UG/L	6
CYANIDE	MG/L	0.00
DETERGENTS (MBAS)	MG/L	0.3
FLUORIDE DISS	MG/L	0.1
HARDNESS NONCARB	MG/L	2
HARDNESS TOTAL	MG/L	10
IRON DISSOLVED	UG/L	20
LEAD DISSOLVED	UG/L	5
LITHIUM DISSOLVED	UG/L	0
MAGNESIUM DISS	MG/L	0.1
MANGANESE DISSOLVED	UG/L	10
MERCURY DISSOLVED	UG/L	0.5
MOLYBDENUM DISSOLVED	UG/L	0
NICKEL DISSOLVED	UG/L	7
NITR. NH4 AS NH4 DIS	MG/L	0.95
NITR. NO2 AS NO2 DIS	MG/L	0.03
NITR. NO3 AS NO3 DIS	MG/L	2.5
NITROGEN NH4 ASN DIS	MG/L	0.74
NITROGEN NO2 ASN DIS	MG/L	0.01
NITROGEN NO3 ASN DIS	MG/L	0.56
NITROGEN TOTKJD AS N	MG/L	0.94
NO2+NO3 AS N DISS	MG/L	0.57
OIL AND GREASE	MG/L	0.0
PH FIELD		4.5
PHENOLS	UG/L	11
PHOS ORTHO DIS AS P	MG/L	0.04
PHOSPHATE DIS ORTHO	MG/L	0.12
PHOSPHORUS TOT AS P	MG/L	0.06
POTASSIUM DISS	MG/L	0.9
RESIDUE DIS CALC SUM	MG/L	19
RESIDUE DIS TON/AFT		0.03
RESIDUE DIS 180C	MG/L	22
SAR		0.2
SELENIUM DISSOLVED	UG/L	1
SILICA DISSOLVED	MG/L	0.8
SODIUM DISS	MG/L	1.3
SODIUM PERCENT		21
SP. CONDUCTANCE LAB		26
STRONTIUM DISSOLVED	UG/L	80
SULFATE DISS	MG/L	3.6
SULFIDE DISSOLVED	MG/L	0.0
TURBIDITY (JTU)		3
VANADIUM DISSOLVED	UG/L	0.8
ZINC DISSOLVED	UG/L	10

CONTINUED ON NEXT PAGE

WATER QUALITY ANALYSIS CONTINUED
LAB ID # 208060 RECORD # 1605

SAMPLE LOCATION: NO NAME
STATION ID: 99999999 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1320

CATIONS	(MG/L)	(MEQ/L)	ANIONS	(MG/L)	(MEQ/L)
CALCIUM DISS	3.6	0.180	BICARBONATE	9	0.148
MAGNESIUM DISS	0.1	0.009	CARBONATE	0	0.000
POTASSIUM DISS	0.9	0.024	CHLORIDE DISS	0.6	0.017
SODIUM DISS	1.3	0.057	FLUORIDE DISS	0.1	0.006
			SULFATE DISS	3.6	0.075
			NO2+NO3 AS N D	0.57	0.041
TOTAL		0.267	TOTAL		0.285

PERCENT DIFFERENCE = -3.24

Unpublished Records
Subject to Revision

QUALITY CONTROL INFORMATION FOR LAB ID # 208060 RECORD # 1605

**ROE(LC 27)/CALCULATED SOLIDS RATIO IS EITHER BELOW 0.90 OR ABOVE 1.12----RATIO VALUE = 1.157
CARBON ORG SUS WAS DELETED BECAUSE: IMPROPER SAMPLE.

Unpublished Records
Subject to Revision

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

WATER QUALITY ANALYSIS
LAB ID # 209058 RECORD # 23492

UNPUBLISHED RECORDS
SUBJECT TO REVISION

SAMPLE LOCATION: NO INFORMATION IN STATION HEADER FILE
STATION ID: LAB ID 209058 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1325
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
COLL BY LARK PROCESSED 7/21, VTN PRECIP STA AT RETORT SITE

ALUMINUM DISSOLVED	DETR. DELETED	LEAD DISSOLVED	DETR. DELETED
BARIUM DISSOLVED	DETR. DELETED	LITHIUM DISSOLVED	DETR. DELETED
BERYLLIUM DISSOLVED	DETR. DELETED	MANGANESE DISSOLVED	DETR. DELETED
BISMUTH DISSOLVED	DETR. DELETED	MOLYBDENUM DISSOLVED	DETR. DELETED
BORON DISSOLVED	DETR. DELETED	NICKEL DISSOLVED	DETR. DELETED
CADMIUM DISSOLVED	DETR. DELETED	PH FIELD	4.5
CHROMIUM DISSOLVED	DETR. DELETED	SILVER DISSOLVED	DETR. DELETED
COBALT DISSOLVED	DETR. DELETED	STRONTIUM DISSOLVED	DETR. DELETED
COPPER DISSOLVED	DETR. DELETED	TIN DISSOLVED	DETR. DELETED
GALLIUM DISSOLVED	DETR. DELETED	TITANIUM DISSOLVED	DETR. DELETED
GERMANIUM DISSOLVED	DETR. DELETED	VANADIUM DISSOLVED	DETR. DELETED
IRON DISSOLVED	DETR. DELETED	ZINC DISSOLVED	DETR. DELETED
		ZIRCONIUM DISSOLVED	DETR. DELETED

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Records
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 209060 RECORD # 23496

SAMPLE LOCATION: NO INFORMATION IN STATION HEADER FILE
STATION ID: LAB ID 209060 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760720 END-- TIME--1330
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
COLL BY LARK PROCESSED 7/21, VTN PRECIP STA AT RETORT SITE, IF GROSS A>4PC/L DO 466-1 470, IF GROSS B>100 PC/L DO 461 & 467

GROS-A,D,U-NAT	UG/L	0.4	PH FIELD		4.5
GROS-B,D,CS137	PCI/L	4.1	POTASSIUM DISS	MG/L	0.9
GROS-B,D,SR-90-	PCI/L	3.6	POTASSIUM 40,D.PCI/L		0.7
			RESIDUE TOT FIL 105C	MG/L	16

CATIONS	(MG/L)	(MEQ/L)	ANIONS	(MG/L)	(MEQ/L)
POTASSIUM DISS	0.9	0.024			
TOTAL		0.023	TOTAL		

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, ATLANTA, GEORGIA

WATER QUALITY ANALYSIS
LAB ID # 153154 RECORD # 49374

Unpublished Records
Subject to Revision

SAMPLE LOCATION: NO NAME
STATION ID: PWS-3 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--1120
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
RAINFALL .5 SAMPLES THAT REQUIRED CHILLING WERE DISCARDED BECAUSE OF TIME LAG

ALK,TOT (AS CACO3)	MG/L	3	MAGNESIUM DISS	MG/L	0.2
ALUMINUM DISSOLVED	UG/L	70	MANGANESE DISSOLVED	UG/L	0
ARSENIC DISSOLVED	UG/L	0	MERCURY DISSOLVED	UG/L	0.2
BARIUM DISSOLVED	UG/L	0	MOLYBDENUM DISSOLVED	UG/L	0
BERYLLIUM DISSOLVED	UG/L	0	NICKEL DISSOLVED	UG/L	0
BICARBONATE	MG/L	4	POTASSIUM DISS	MG/L	0.2
BORON DISSOLVED	UG/L	20	RESIDUE DIS CALC SUM	MG/L	6
BROMIDE	MG/L	0.0	RESIDUE DIS TON/AFT		0.02
CADMIUM DISSOLVED	UG/L	0	RESIDUE DIS 180C	MG/L	16
CALCIUM DISS	MG/L	0.5	SAR		0.1
CARBON DIS ORGANIC	MG/L	2.8	SELENIUM DISSOLVED	UG/L	0
CARBON ORG SUS	MG/L	0.1	SILICA DISSOLVED	MG/L	0.0
CHLORIDE DISS	MG/L	0.0	SODIUM DISS	MG/L	0.4
CHROMIUM DISSOLVED	UG/L	0	SODIUM PERCENT		27
COPPER DISSOLVED	UG/L	3	SP. CONDUCTANCE LAB		7
FLUORIDE DISS	MG/L	0.1	STRONTIUM DISSOLVED	UG/L	40
HARDNESS NONCARB	MG/L	0	SULFATE DISS	MG/L	2.0
HARDNESS TOTAL	MG/L	2	SULFIDE DISSOLVED	MG/L	0.0
IRON DISSOLVED	UG/L	20	TURBIDITY (JTU)		1
LEAD DISSOLVED	UG/L	0	VANADIUM DISSOLVED	UG/L	0.7
LITHIUM DISSOLVED	UG/L	0	ZINC DISSOLVED	UG/L	0

CATIONS	(MG/L)	(MEQ/L)	ANIONS	(MG/L)	(MEQ/L)
CALCIUM DISS	0.5	0.025	BICARBONATE	4	0.066
MAGNESIUM DISS	0.2	0.017	CHLORIDE DISS	0.0	0.000
POTASSIUM DISS	0.2	0.006	FLUORIDE DISS	0.1	0.006
SODIUM DISS	0.4	0.018	SULFATE DISS	2.0	0.042
TOTAL		0.064	TOTAL		0.112

PERCENT DIFFERENCE = -27.52

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

Unpublished Records
Subject to Revision

WATER QUALITY ANALYSIS
LAB ID # 135019 RECORD # 15011

SAMPLE LOCATION: NO INFORMATION IN THE STATION HEADER FILE.
STATION ID: NO.PWS-3 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--1125
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
PWS-3 IS AT RAINGAGE #AR-1. RAINFALL = 0.5".

ALUMINUM DISSOLVED	DETR. DELETED	LEAD DISSOLVED	DETR. DELETED
BARIUM DISSOLVED	DETR. DELETED	LITHIUM DISSOLVED	DETR. DELETED
BERYLLIUM DISSOLVED	DETR. DELETED	MANGANESE DISSOLVED	DETR. DELETED
BISMUTH DISSOLVED	DETR. DELETED	MOLYBDENUM DISSOLVED	DETR. DELETED
BORON DISSOLVED	DETR. DELETED	NICKEL DISSOLVED	DETR. DELETED
CADMIUM DISSOLVED	DETR. DELETED	SILVER DISSOLVED	DETR. DELETED
CHROMIUM DISSOLVED	DETR. DELETED	STRONTIUM DISSOLVED	DETR. DELETED
COBALT DISSOLVED	DETR. DELETED	TIN DISSOLVED	DETR. DELETED
COPPER DISSOLVED	DETR. DELETED	TITANIUM DISSOLVED	DETR. DELETED
GALLIUM DISSOLVED	DETR. DELETED	VANADIUM DISSOLVED	DETR. DELETED
GERMANIUM DISSOLVED	DETR. DELETED	ZINC DISSOLVED	DETR. DELETED
IRON DISSOLVED	DETR. DELETED	ZIRCONIUM DISSOLVED	DETR. DELETED

Insufficient amount of sample. Dissolved solids too low.

Unpublished Records
Subject to Revision

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

WATER QUALITY ANALYSIS
LAB ID # 135018 RECORD # 15009

SAMPLE LOCATION: NO INFORMATION IN THE STATION HEADER FILE.
STATION ID: NO.PWS-3 LAT.LONG.SEQ.:
DATE OF COLLECTION: BEGIN--760508 END-- TIME--1130
COUNTY CODE: 047 PROJECT IDENTIFICATION: 4649113
DATA TYPE: 2 SOURCE: PRECIPITATION GEOLOGIC UNIT:
COMMENTS:
PWS-3 IS AT RAINGAGE #AR-1. RAINFALL = 0.5".

GROS-A,D,U-NAT UG/L	15	GROS-B,D,SR-90-PCI/L	2.7
GROS-B,D,CS137 PCI/L	3.3	POTASSIUM 40,D.PCI/L	0.1
		RESIDUE TOT FIL 105C MG/L	77

QUALITY CONTROL INFORMATION FOR LAB ID # 153154 RECORD # 49374

*THIS CONSTITUENT HAS BEEN REPORTED AS <= TO 0, LOOK AT-- CHLORIDE DISS VALUE = 0.000
*THIS CONSTITUENT HAS BEEN REPORTED AS <= TO 0, LOOK AT-- SILICA DISSOLVED VALUE = 0.000
*CATION/.01(CONDUCTANCE) RATIO IS EITHER BELOW 0.92 OR ABOVE 1.24---------RATIO VALUE = 0.913
*CALCULATED SOLIDS/CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.81---RATIO VALUE = 0.857
*THE ROE (LC 27) /CONDUCTANCE RATIO IS EITHER BELOW 0.55 OR ABOVE 0.86---RATIO VALUE = 2.285
*ROE(LC 27)/CALCULATED SOLIDS RATIO IS EITHER BELOW 0.90 OR ABOVE 1.12----RATIO VALUE = 2.666

II. AIR RESOURCES

Air Resources Report

Submitted under separate cover

III. BIOLOGY

Key to abbreviations of scientific names of plant species, locations, and bloom conditions

Key to abbreviations of Scientific names of plant species, locations, and bloom conditions of sce

Key to abreviations ~~in Tables I-IV~~. Column headings for plant species, locality and bloom condition.

Plant Species

1.	Amel utah	=	Amelanchier utahensis
2.	Artem ludov	=	Artemesia ludoviciana
3.	Artem triden	=	Artemesia tridentata
4.	Ascle crypt	=	Asclepias cryptoceras
5.	Atrip canes	=	Atriplex canescens
6.	Atrip confe	=	Atriplex confertifolia
7.	Bassia hysso	=	Bassia hyssopifolia
8.	Brom tect	=	Bromus tectorum
9.	Choris tenel	=	Chorispora tenella ~~us~~
10.	Chrys naus	=	Chrysothamnus nauseosus
11.	Chrys visci	=	Chrysothamnus viscidifloris
12.	Clema ligus	=	Clematis ligusticifolia ~~us~~
13.	Cleome lutea	=	Cleome lutea
14.	Descu sophia	=	Descurainia sophia
15.	Eriog microt	=	Eriogonum microthecum
16.	Gilia calcar	=	Gilia calcarata
17.	Grind squar	=	Grindelia squarosa
18.	Guier sarot	=	Gutierrezia sarothrae
19.	Halog glome	=	Halogeton glomeratus
20.	Holod micro	=	Holodiscus microphyllus
21.	Junip osteo	=	Juniperus osteosperma
22.	Lepid mont	=	Lepidium montanum
23.	Melil alba	=	Melilotus alba
24.	Popul fremon	=	Populus fremontii
25.	Rhus trilo	=	Rhus trilobata
26.	Salix exig	=	Salix exigua
27.	Salso kali	=	Salsola kali
28.	Sarco vermi	=	Sarcobatus vermiculatus
29.	Sphaer cocc	=	Sphaeralcea coccinea
30.	Tamar penta	=	Tamarix pentandra

Locations

1.	So Cyn	=	Southam Canyon (near summit)
2.	Rag top	=	Near Southeast Corner of Section 23
3.	WhRBr	=	White River Bridge
4.	"Duck"	=	"Rock" formation by entrance to Ua
5.	EvacCr	=	Evacuation Creek Bridge

Bloom Conditions

1.	Bloom	=	in bloom (sometimes only partial on Tamarix)
2.	Old Blo	=	Bloom stage nearly finished
3.	nBloom	=	not in bloom
4.	Bud	=	in bud stage

Insects per 50 strokes

of 12-inch insect net

TABLE 4

INSECTS PER 50 STROKES OF 12-INCH INSECT NET, OIL SHALE TRACTS Ua, Ub. June [illegible]976

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																							
	Chrys naus WhRBr nBloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn nBloom	Artem triden SoCyn Bloom	Sarco vermi SoCyn Bloom	Atrip conf. SoCyn nBloom	Atrip canes SoCyn Bloom	Bassia hysso WRBr Bloom	Rhus trilo WRBr nBloom	Salix exig WRBr Bloom	Tamar penta WRBr Bloom	Cleome lutea WRBr Bloom	Choris tenel WRBr Bloom	Descu sophia WRBr Bloom	Sphaer cocc "Duck" Bloom	Brom tect WRBr Bloom	Holod micro RagTop Bloom	Junip osteo SoCyn nBloom	ALL
HYMENOPTERA																				
Halticoptera No. 6																		1	1	
Cyclogastrolla No. 1	1	4			3	1			1		2								12.	
Cyclogastrolla No. 5				1															1	
Mesopolobus No. 1					6														6	
Mesopolobus No. 6												2							2	
Habrocytus No. 2					2														2	
Habrocytus No. 3															1				1	
Habrocytus No. 5		2										1						1	4	
Habrocytus No. 6											1								1	
Pseudocatalaccus No. 5										2	1	7			6				16	
Protolaccus No. 1	4	3																	7	
Gastancistrus No. 1															1			8	9	
Gastancistrus No. 2																		4	4	
Gastancistrus No. 3																		1	1	
Gastancistrus No. 4					1														1	
Pachyneuron No. 1																		1	1	
Pachyneuron No. 2												1							1	
Rhizomalus No. 1																		1	1	
Psilocerus No. 1							1												1	
Tetrastichus No. 1			1		8	1						1		1	1				13	
Tetrastichus No. 4												2						2	4	
Tetrastichus No. 5															2				2	
Tetrastichus No. 6		2			29						1	3							35	
Tetrastichus No. 7		1			4													4	9	
Diglyphus No. 1		1																	1	
Zagogrammini No. 1			1																1	
Eulophidae No. 2																		1	1	
Eulophidae No. 7					9		1												10	
Eulophidae No. 9							1												1	
Encyrtus No. 1	2																		2	
Encyrtidae No. 5											2								2	
Encyrtidae No. 6						1													1	
Encyrtidae No. 9						1									1				2	
Encyrtidae No. 10											1	1							2	
Eurytoma No. 1																1			1	
Bruchophagus No. 1						1													1	
Torymus aenoscapus										1									1	
Torymus dasyneuri																		7	7	
Torymus albitarsis											1								1	
Torymus koebelei												3							3	
Torymus aea										1									1	
Torymus No. 2																		2	2	
Mymaridae No. 1	1					3					1			3				1	9	
Eupelmidae No. 1			2						1										3	
Trichogrammatidae No. 2						1													1	
Platygaster No. 3		2																3	5	
Platygaster utahensis										3		1							4	
Inostemma No. 1																		3	3	
Metaclisis No. 1																		1	1	
Synopeas No. 2				1															1	

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																	
	Chrysnaus WhRBr nBloom	Chrysnaus SoCyn nBloom	Chrysviscit SoCyn Bloom	Artemtriden SoCyn nBloom	Sarcovermi SoCyn nBloom	Atripconf SoCyn nBloom	Atripcanes SoCyn Bloom	Bassiahysso WRBr nBloom	Rhustrilo WRBr nBloom	Salixexig WRBr Bloom	Tamarpenta WRBr Bloom	CleomeLutea WRBr Bloom	Chorisfenel WRBr Bloom	Descusophia WRBr Bloom	Sphaercocc "Duck" Bloom	Bromtect WRBr Bloom	Holodmicro RagTop nBloom	Juniposteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	8	15	4	2	62	9	3		2	7	10	22		4	12	1		41	202
Gyron pennsylvanicus																		1	1
Telenomus No. 1		1														1			2
Telenomus No. 3						1													1
Dissolcus No. 1									1										1
Trissolcus utahensis						2	2												4
Allotria No. 1					3														3
Apanteles No. 1				1	1							1			1				4
Apanteles No. 6												1							1
Mirax No. 1									1										1
Bracon No. 8				1															1
Lysiphlebus testaceipes					1														1
Microchelonus No. 2												2							2
Iphiaulax No. 1											1								1
Ichneumonidae No. 4													2						2
Ichneumonidae No. 6								2						3					5
Dryinidae No. 1						1													1
Pogonomyrmex occidentalis												1							1
Formica lasiodes			16					12		4				2		3			37
Dorymyrmex pyramicus	3	2	7	4			2			3	2	6	6				2		37
Tapinoma sessile		3	4							9		2					1		19
Monomorium minimum		8	3									2							13
Lasius niger										3									3
Ammoplanops cockerelli											6								6
Pulverro No. 1											2								2
Spilomena No. 1											2								2
Ochleroptera bipunctata											1								1
Lindenius No. 1								1											1
Crabro pallida											1								1
Palmodes dimidiatus							1												1
Podalonia luctuosa											1								1
Hylaeus cressoni														1					1
Evylaeus No. 1										1									1
Halictus tripartitus											1								1
Dialictus No. 1												2							2
Dialictus No. 8												4	2						6
Dialictus No. 10										1									1
Agapostemon texanus												1							1
DIPTERA																			
Hydrobaenus No. 1					1						2								3
Hydrobaenus No. 4	2													16					18
Hydrobaenus No. 8	11									2	3	2	2						20
Hydrobaenus No. 9											2								2
Cricotopus No. 1													1						1
Cricotopus No. 2										6	1			3					10
Chironomus No. 2									2										2
Microtendipes No. 1																1			1
Tandypodinae No. 1								1	3										4
Neolasioptera No. 1					1													1	2
Aedes vexans	8							4						1		3			16

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																	
	Chrysnaus nBloom	Chrysnaus nBloom	Chrysvisci nBloom	Artemtriden nBloom	Sarcovermi nBloom	Atripconf nBloom	Atripcanes nBloom	Bassiahysso nBloom	Rhustrilo nBloom	Salixexig Bloom	Tamarpenta Bloom	Cleomelutea Bloom	Choristenel Bloom	Descusophia Bloom	Sphaercocc "Duck" Bloom	Bromtect Bloom	Holodmicro nBloom	Juniposteo nBloom	ALL
	WhRBr	SoCyn	SoCyn	SoCyn	SoCyn	SoCyn	SoCyn	WRBr	WRBr	WRBr	WRBr	WRBr	WRBr	WRBr		WRBr	RagTop	SoCyn	
TOTALS BROUGHT FORWARD	32	29	34	8	69	13	8	20	9	36	35	46	13	30	13	9	3	43	450
Aedes melanimon								13								4			17
Leptoconops torrens	2								1								1		4
Leptoconops kerteszi					13			2	1		2			1	1	1		1	22
Dasyhelea mutabilis														3					3
Culicoides (Selfia) No. 1	1																		1
Bradysia No. 1								5						2					7
Bradysia No. 2	2																		2
Mycetophilidae No. 1								1	3										4
Simulium griseum							1												1
Drapetis No. 2											1								1
Platypalpus No. 2	9	2								2				4					17
Mythicomyia No. 3											1								1
Mythicomyia No. 4												1							1
Mythicomyia No. 6											2								2
Mythicomyia No. 7			1										1						2
Mythicomyia No. 8															1				1
Mythicomyia No. 10											1								1
Mythicomyia atra											1			2					3
Oligodranes No. 3											1								1
Geron No. 1							1				2	1							4
Scenopinidae No. 1											2								2
Nemotelus politus									1		1								2
Pipunculus No. 1																1			1
Medetera N. 1																		1	1
Asteia multipunctata						1													1
Ophiomyia No. 2								1											1
Oxyna palpalis				1															1
Trupanea bisetosa		1			1										1				3
Tephritis araneosa	2	1			2									1	2				8
Paroxyna clathrata	7				3							1			2				13
Neaspilota No. 1					1							1							2
Liriomyza No. 1								2			1	4							7
Liriomyza No. 5					2														2
Calycomyza No. 2				1															1
Agromyzidae No. 2		1																	1
Chamaemyia No. 1											1								1
Leucopis No. 1	5	1	3			2					4								15
Leucopis No. 2	2	3			5							5							15
Lasiosina similis										2									2
Thaumatomya glabra			1								1								2
Siphonella neglecta											3				9				12
Oscinella frit												1							1
Aphanotrigonum No. 1											2								2
Olcella punctifrons											1				1				2
Psilopa compta																1			1
Allotrichoma No. 1										4	1			13					18
Phyligria debilis	1				1								2	1					5
Leptocera No. 1								1											1
Trixoscelis frontalis	3																1		4

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																	
	Chrys naus WhBRr nBloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn nBloom	Artem triden SoCyn Bloom	Sarco vermi SoCoy Bloom	Atrip conf SoCyn nBloom	Atrip canes SoCyn Bloom	Bassia hysso WRBr nBloom	Rhus trilo WRBr Bloom	Salix exig WRBr Bloom	Tamar penta WRBr Bloom	Cleome lutea WRBr Bloom	Choris tenel WRBr Bloom	Descu sophia WRBr Bloom	Sphaer cocc "Duck" Bloom	Brom tect WRBr Bloom	Holod micro RagTop Bloom	Junip osteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	66	38	39	10	97	16	10	45	15	44	63	60	16	57	30	16	5	45	672
Pelomya coronata		2		1				4		2				12					21
Sepsis No. 1								1											1
Oedoba capito											3								3
Otites pyrrhocephala										1									1
Otitidae No. 2					1														1
Phormia regina	1																		1
Tachinidae No. 3				1															1
Hylemya platura								1						1					2
Anthomyiidae No. 2										2									2
Scatophaga stercoraria								1											1
Opsius stactogalus											325								325
Empoasca exigua										15				2					17
Empoasca alboneura	8		6	6															20
Empoasca neaspersa	1	23	3	14															41
Empoasca typhlocyboides		2	4																6
Idiocerus rotundus	1																		1
Idiocerus morosus										1									1
Dikraneura carneola	2	3						2				5				5			17
Coladonus belli	1							4											5
Stragana grandis																	12		12
Erythroneus asper												13				2			15
Circulifer tenellus			378			272													650
Aceratagallia cinerea		4	9					1											14
Aceratagallia No. 1									1				1						2
Exitianus exitiosus			9			4													13
Ballana aris						1													1
Aplanus albidus						2													2
Cicadellidae No. 3		3		1															4
Hebecephalus No. 1										26				6					32
Clastoptera (nymph)			5																5
Hysteropterum cornutum			1																1
Aridia compressa		3																	3
Aphalara No. 1		2																	2
Aphalara No. 2										8				2					10
Aphalara No. 5				9															9
Aphalara minutissima									47										47
Calophya triozomima					13														13
Aphis bonnevillensis				3															3
Pseudepamoebaphis No. 1	4	9								3									13
Pleotrichophorus No. 1										3									3
Phopalosiphum No. 1										7									7
Covariella aegypodii																2			2
Trigonotylus tarsatus								12					18	64	13				107
Orthotylus altheae																5			5
Orthotylus No. 1						2		6						3					11
Pseudatomoscelis modestus									2										2
Brachyopterus (?) No. 1	4	1										1		1					7
Lygus hesperus					46					4								1	51
Parthenicus No. 6																			

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																	
	Chrysnaus WhBRr nBloom	Chrysnaus SoCyn nBloom	Chrysvisci Socyn nBloom	Artemtriden SoCyn nBloom	Sarcovermi SoCyn Bloom	Atripconf SoCyn nBloom	Atripcanes SoCyn Bloom	Bassiahyssq WRBr nBloom	Rhustrilo WRBr nBloom	Salixexig WRBr Bloom	Tamarpenta WRBr Bloom	Cleomelutea WRBr Bloom	Choristenel WRBr Bloom	Descusophia WRBr Bloom	Sphaercocc "Duck" Bloom	Bromtect WRBr Bloom	Holodmicro RagTop nBloom	Juniposteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	88	90	454	45	157	297	10	77	65	113	391	79	35	148	43	30	17	46	2185
Parthenicus No. 8			4				1												5
Eurobiella No. 1		1																	1
Labopidea sericata				7															7
Phyllopidea picta				5															5
Miridae No. 2																		2	2
Miridae No. 4						5													5
Nyssius ericae						3		9		1			115	2		6			136
Sphragisticus nebulosus								2						1					3
Sinea diadema			4																4
Nabis alternatus		2	5	1											3				11
Thyanta punctiventris						2	7												9
Orius tristicolor												2							2
Ortheziidae No. 1															1				1
Scymnus renoicus			1		3	1													5
Psyllobora 20-maculata								1											1
Bruchidae No. 1							1												1
Bruchidae No. 4										1									1
Diachus auratus										6									6
Phyllotreta No. 1									3			16	3	4					26
Cryptocephalus No. 1						1													1
Cryptocephalus confluentus			1																1
Monoxia elegans						15													15
Epimechus No. 1			12	3															15
Curculionidae No. 5									4	4				1					9
Curculionidae No. 6				1															1
Agrilus No. 1			8																8
Stilbus No. 1														1					1
Cryptorhopalum uteanum												1							1
Ameocorus luteipes		2										9							11
Eudastes No. 1					2														2
Anthocomus No. 1										2									2
Listus interruptus					2														2
Stylopidae No. 1										1									1
Stylopidae No. 2						1													1
MISCELLANEOUS																			
Frankliniella No. 1							3					28		8					39
Thripidae No. 2										5					26				31
Leptothrips No. 1	1				3	3													7
Oelolothrips No. 1		2										13							15
Agulla No. 1					2														2
Sminthuridae No. 1							4												4
Melanoplus differentialis										1									1
Melanoplus mexicanus			17				1												18
Acrididae (nymph)	2			2												3			7
Microlepidoptera No. 1														9					9
Microlepidoptera No. 2																	6		6
GRAND TOTALS	91	97	506	64	169	328	27	89	72	134	391	148	153	174	73	39	23	48	2626
DIVERSITY	28	29	27	20	29	24	14	24	15	33	41	37	11	31	18	15	6	22	250

TABLE 3

INSECTS PER 50 STROKES OF 12-I[illegible] INSECT NET, OIL SHALE TRACTS Ua, Ub.

July 8, 1976

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION, AND BLOOM CONDITION																			
HYMENOPTERA	Chrysnaus EvaCrnBloom	Chrysnaus SoCynBloom	Chrysnaus SoCynBloom	Artemtriden SoCynnBloom	Artemludov RagTopnBloom	Atripconfe SoCynnBloom	Atripcanes SoCynnBloom	Sarcovermi EvacCrnBloom	Salsokali SoCynnBloom	Cleomelutea SoCynBloom	Melilalba EvacCrBloom	Tamarpenta RagTopBloom	Tamarpenta EvacCrBloom	Rhustrilo RagTopnBloom	Holodmicro RagTopBloom	Asclecrypt RagTopBloom	Salixexig WRBrnBloom	Juniposteo SoCynnBloom	All
Halticoptera No. 1			1																1
Halticoptera No. 2								1						1					2
Cyclogastrolla No. 1	3	4	6	1	1			2	1		1				2				21
Cyclogastrolla No. 5					13					5		2							20
Gastancistrus No. 1					1														1
Gastancistrus No. 2		1	3													2			6
Gastancistrus No. 4									1							28			29
Habrocytus No. 1																2			2
Habrocytus No. 4										2									2
Habrocytus No. 6			1										1						2
Pseudocatalaccus No. 4			2								1					3			6
Pseudocatalaccus No. 5															1				1
Psilocerus No. 1										1			1			1		1	4
Mesopolobus No. 6			3		1		1								2				7
Protolaccus No. 2			3																3
Chlorocistrus No. 1															2				2
Chlorocistrus No. 3			1																1
Hobbya No. 1					2								4		1				7
Homoporus No. 1													1						1
Callitula No. 1															1				1
Tetrastichus No. 1										3		2			2				7
Tetrastichus No. 2													1						1
Tetrastichus No. 4																3		3	6
Tetrastichus No. 5			14																14
Tetrastichus No. 6		2	5		7	1		2		5					5	4			31
Tetrastichus No. 7	1		3	1	4			3					3		1				16
Tetrastichus No. 12			1		2														3
Tetrastichus No. 13															1				1
Tetrastichus No. 14										2									2
Tetrastichus No. 19										2									2
Tetrastichus No. 20															2				2
Euderus No. 1			2																2
Necremnus No. 1													2			1			3
Pnigalio No. 1										5		2							7
Entedon bigelovia	1																		1
Closterocerus No. 1			3																3
Achrysocharella No. 1			1												1			1	3
Zagogramminae No. 1								1											1
Eulophidae No. 1	2	2				1	4	1				1	5						16
Eulophidae No. 7							1												1
Eulophidae No. 9				1		2				114									117
Encyrtus No. 1			1																1
Encyrtidae No. 3										1									1
Encyrtidae No. 5	1		8																9
Encyrtidae No. 10				1															1
Encyrtidae No. 11																		2	2
Elasmus No. 1																2			2
Torymus albitarsis												2	2						4
Torymus aenoscapus	2		1							1	2			1					7

BLE II (continued)

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																			
	Chrysnaus EvacCrnBloom	Chrysnaus SoCynnBloom	Chrysnaus SoCynBloom	Artemtriden SoCynnBloom	Artemludov RagTopnBloom	Atripconfe SoCynnBloom	Atripcanes SoCynBloom	Sarcovermi EvacCrnBloom	Salsokali SoCynnBloom	Cleomelutea SoCynnBloom	Melilalba EvacCrBloom	Tamarpenta RagTopBloom	Tamarpenta EvacCrBloom	Rhustrilo RagTopnBloom	Holodmicro RagTopBloom	Asclecrypt RagTopBloom	Salixexig WRBrnBloom	Juniposteo SoCynnBloom	All
TOTALS BROUGHT FORWARD	10	9	59	4	31	4	6	10	2	141	4	9	20	2	21	46		7	385
Torymus kinseyi																2			2
Torymus koebelei			2									2				1			5
Torymus No. 1															1			1	2
Torymus No. 3															1		1	1	3
Pseudotorymus NO. 1													1						1
Perilampus No. 1			5	1															6
Perilampus No. 2																7			7
Rileya No. 1	1											1	1						3
Bruchophagus No. 1	1										2					6			9
Megastigmus No. 1												1							1
Megastigmus No. 3										1									1
Eurytoma No. 1											1					1			2
Eurytoma No. 2								1				3	1						5
Eurytoma No. 5			1																1
Spilochalcis sidae																1			1
Brachymena tegularis									1										1
Hypothoracicinae No. 1													2						2
Chalcididae No. 1			1						1										2
Eupelmidae No. 1	2																		2
Eupelmidae No. 2	1																		1
Eupelmidae No. 4			1																1
Eupelmidae No. 5																		1	1
Mymaridae No. 2					1														1
Trichogrammatidae No. 3					1														1
Trichogrammatidae No. 4					1														1
Leucospis affinis												1							1
Platygaster utahensis	1																		1
Platygaster No. 1			2						1						4				7
Synopeas NO. 4													3						3
Inostemma No. 1																		3	3
Telenomus No. 1			2																2
Telenomus No. 2			1				1		1				3			1			7
Trissolcus utahensis			2										1						3
Scelionidae No. 1							1												1
Allotria No. 1											1								1
Hypodiranchus NO. 2															1				1
Aporencoela No. 1			2					1		3						1			7
Episoda No. 1								1		1									2
Cothonaspis No. 1										1									1
Trioxys bonnevillensis									1										1
Lysiphlebus testaceipes										1									1
Opius No. 2									1										1
Opius No. 4			1																1
Opius No. 6										2									2
Apanteles No. 1	3		3		1			1					1				1		10
Apanteles No. 8			1																1
Parahormius No. 1																		1	1
Microchelonus No. 6	2																		2

TABLE II (continued)

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION, AND BLOOM CONDITION																		
	Chrys naus EvacCr nBloom	Chrys naus SoCyn nBloom	Chrys naus SoCyn Bloom	Artem triden SoCyn nBloom	Artem ludov RagTop Bloom	Atrip confe SoCyn nBloom	Atrip canes SoCyn Bloom	Sarco vermi EvacCr Bloom	Salso kali SoCyn nBloom	Cleome lutea SoCyn Bloom	Melil alba EvacCr Bloom	Tamar nenta RagTop Bloom	Tamar penta EvacCr Bloom	Rhus trilo RagTop nBloom	Holod micro RagTop Bloom	Ascle crypt RagTop Bloom	Salix exig WRBr nBloom	Junip osteo SoCyn nBloom	All
TOTALS BROUGHT FORWARD	21	9	83	5	35	4	8	14	8	150	8	17	33	2	28	66	2	14	507
Bracon gelechiae	1																		1
Bracon No. 5			3					1											4
Meteorus leviventris	1																		1
Braconidae No. 2			1																1
Mirax No. 2														1					1
Ichneumonidae No.8																	1		1
Ichneumonidae No. 10	1																		1
Paratiphia No. 2												1							1
Formica No. 1				1						1						8			10
Formica lasioides		9		8	3		3		5				3			4			35
Tapinoma sessile				3	4	8					2				2				19
Dorymyrmex pyramicus	116	2				1		213		1	1			9			102		445
Polistes centralis											1								1
Ancistrocerus tuberculocephalus											1								1
Stenodynerus apache												3							3
Stenodynerus blandoides											1								1
Euodynerus annulatus												1	2			3			6
Microdynerus bakerianus	1																		1
Eumenes bollii												1							1
Palmodes dimidiatus													1						1
Ammophila cleopatra													2						2
Ammophila aberti											1	2							3
Microbembex monodonata													2						2
Microbembex No. 1													5						5
Bicyrtes ventralis													3						3
Tachytes sayi													1						1
Tachysphex ashmeadii													2						2
Oxybelus emarginatus			1												1				2
Oxybelus fossor											1				1				2
Oxybelus packardii															1				1
Oxybelus parvus											3								3
Oxybelus uniglumis																1			1
Dryudella kohli	1																		1
Diodontus No. 2			2								1								3
Spilomena No. 1	9		2									4							15
Spilomena No. 2	1																		1
Pulverro No. 1	1		1									1			2				5
Ammoplanops cockerelli	4										1				2				7
Stizoides unicinctus													1						1
Philanthus multimaculatus			1								4		4						9
Philanthus pacificus													9						9
Cerceris convergens												3	2						5
Cerceris californicus													1						1
Cerceris conifrons													2						2
Eucerceris vittatifrons												2							2
Hylaeus stevensi											4								4
Colletes dissoptus											1		2						3
Nomadopsis scitulae											1								1

TABLE II (continued)

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																		
	Chrysnaus EvacCrnBloom	Chrysnaus SoCynBloom	Chrysnaus SoCynBloom	Artemtriden SoCynBloom	Artemludov RagTopBloom	Atripconfe SoCynBloom	Atripcanes SoCynBloom	Sarcovermi EvacCrBloom	Salsokali SoCynBloom	Cleomelutea SoCynBloom	Melilalba EvacCrBloom	Tamarpenta RagTopBloom	Tamarpenta EvacCrBloom	Rhustrilo RagTopBloom	Holodmicro RagTopBloom	Asclecrypt RagTopBloom	Salixexig WRBrBloom	Juniposteo SoCynBloom	All
TOTALS BROUGHT FORWARD	157	20	94	17	42	13	11	228	13	152	31	35	75	12	37	82	105	14	1138
Perdita caloleuca											2								2
Halictus ligatus											3		1						4
Halictus virgatellus	1														1				1
Evylaeus No. 5																			1
Dialictus No. 1												6	3	2	1				12
Dialictus No. 2					2														2
Dialictus No. 3																2			2
Dialictus No. 8	1		2						2		5			1		3			14
Dialictus No. 12												1							1
Sphecodes No. 1												1							1
Megachile subexilis												1							1
Megachile texana												1							1
Triepeolus No. 1													1						1
Diadasia enavata													3						3
Neolarria No. 2													1						1
Melissodes subagilis																1			1
DIPTERA																			
Chironomus No. 2					1								3						4
Chironomus No. 3		2																	2
Cricotopus No. 2														2			3		5
Hydrobaenus No. 1								3											3
Hydrobaenus No. 3	2																		2
Hydrobaenus No. 8																	4		4
Culicoides palmerae										7									7
Leptoconops kerteszi	2		2								1		5						10
Leptoconops torrens			6		3														9
Dasyhelea mutabilis			2							19						9			30
Dasyhelea No. 1			1		1				1										3
Rhopzlomyia No. 1	1					1	1												3
Neolasioptera No. 1			1																1
Ledomyia No. 1			2																2
Simulium griseum	3	1					1			2							2		9
Simulium No. 1													1						1
Medetera No. 1			2					1	1						4				8
Chrysotus picticornis														2					2
Megaselia No. 1		1				1	1												3
Megaselia No. 2																	1		1
Platypalpus No. 2											1								1
Drapetis No. 2								5	1				5		7	3			21
Phthiria No. 4											1								1
Mythicomyia atra					1														1
Mythicomyia No. 1								2											2
Mythicomyia No. 2	1												3		1				5
Mythicomyia No. 3												3							3
Mythicomyia No. 4		1										6	1		2				10
Mythicomyia No. 6												2							2
Mythicomyia No. 8									1			1	6						8
Mythicomyia No. 9							1												1

TABLE II (continued)

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																	
	Chrysnaus EvacCrnBloom	Chrysnaus SoCynBloom	Chrysnaus SoCynBloom	Artemtridennl SoCynBloom	Artemludov RagTopBloom	Atripconfe SoCynnBloom	Atripcanes SoCynBloom	Sarcovermi EvacCrBloom	Salsokali SoCynnBloom	Cleomelutea SoCynBloom	Melilalba EvacCrBloom	Tamarpenta RagTopBloom	Tamarpenta EvacCrBloom	Rhustrilo RagTopnBloom	Holodmicro RagTopBloom	Asclecrypt RagTopBloom	Salixexig WRBrnBloom	Juniposteo SoCynnBloom	All
TOTALS BROUGHT FORWARD	168	25	112	17	50	15	15	239	19	180	44	57	108	19	53	100	115	14	1350
Mythicomyia No. 10			2									1							3
Mythicomyia No. 13													2		12				14
Oligodranes No. 2			1																1
Oligodranes No. 4												2							2
Prorates claripennis			1												1				2
Neochaetrichus No. 1				1	1														2
Geron No. 1	2		3					1	3		2		1						12
Villa No. 2											1								1
Scenopinidae No. 1													1						1
Scenopinidae No. 3											1								1
Apatolestes comastes															1				1
Silvius quadrivittatus											1						6		7
Paragus tibialis									2				1						3
Mesogramma marginata									1										1
Pipunculus No. 2											1								1
Zodion americanum													1			1			2
Thecophora propinqua											1								1
Procecidochares minuta													2						2
Tephritis araneosa		1		1		1	1		4		1								9
Paroxyna clathrata									1					9					10
Trupanea jonesi	1													1			1		3
Trupanea bisetosa								1											1
Trupanea nigricornis									1										1
Euaresta tapetis	4																		4
Neospilota No. 1			2					1											3
Asteia multipunctata			1													1	1		3
Leucopis No. 1	3		5	1	1					3		3					4		20
Leucopis No. 2	1							4											5
Siphonella neglecta				1					2	5	1				5	7			21
Siphonella No. 1	2				1		2					1	3						9
Olcella punctifrons												2					3		5
Olcella parva				2					1										3
Olcella provocans													2						2
Aphanotrigonum No. 1												2			8	6			16
Aphanotrigonum No. 2															3	12			15
Conioscinella No. 1	5			2			1		2	326			5		16	29			386
Lasiosina approximatonervis												4							4
Hippelates pusio															1				1
Thaumatomyia glabra	1																		1
Meromyza No. 1						1									1				2
Phyligria debilis				1	1		2						2						6
Atissa pygmeae													4						4
Liriomyza No. 3										2									2
Liriomyza No. 7								2											2
Trixoscelis sagulata										1	1								2
Trixoscelis frontalis	2		1							4									7
Meoneura polita															3	3			6
Meoneura nigrifrons													1						1

TABLE II (continued)

SPECIES OF INSECTS	Chrysnaus EvacCrnBloom	Chrysnaus SoCynBloom	Chrysnaus SoCynBloom	Artemtriden SoCynnBloom	Artemludov RagTopBloom	Atripconfe SoCynnBloom	Atripcanes SoCynBloom	Sarcovermi EvacCrnBloom	Salsokali SoSynBloom	Cleomelutea SoCynBloom	Melilalba EvacCrBloom	Tamarpenta RagTopBloom	Tamarpenta EvacCrBloom	Rhustrilo RagTopnBloom	Holodmicro RagTopBloom	Asclecrypt RagTopBloom	Salixexig WRBrnBloom	Juniposteo SoCynnBloom	All
TOTALS BROUGHT FORWARD	189	26	128	26	54	17	21	248	36	521	54	72	133	29	104	159	130	14	1961
HEMEROMYIA WASHINGTONI							1									2			3
Leptometopa halteralis			6					2	3				4	1	4	5			25
Lauxanidae No. 2			1																1
Sepsis No. 1																1			1
Anthomyza gracilis										3									3
Pelomya coronata	1														1				2
Tethinidae No. 1		1																	1
Oedopa capito	2												1						3
Euxesta No. 1	4	1						4											9
Melieria canus								1											1
Acalypterata No. 1																12			12
Acemya No. 1								2											2
Oxynops anthracinus																	1		1
Paradidyma singularis										1									1
Stomatomyia parvipalpis																1			1
Hyalomyia aldrichii	1												2						3
Blaesoxipha reversa																1			1
Senotainia rubriventris											1	1	2						4
Senotainia flavicornis													1						1
Senotainia trilineata													2	1					3
Leucophora (?) No. 1	1																		1
Hylemya platura								1											1
Hylemya cinerella											1								1
HOMOPTERA-HEMIPTERA																			
Acinoptera virides					1				1										2
Balclutha neglecta		3		3		2	4		4						1				17
Hebecephalus No. 1							1												1
Ballana aris	4	7	1	8	3	2													25
Opsius stactogalus	1										4	28	18	2					53
Stragania grandis	3	2																	5
Empoasca exigua	39																		39
Empoasca alboneura	4	3																	7
Empoasca typhlocyboides				12	3														15
Empoasca neaspersa				8	4														12
Xerophloea peltata					1														1
Aceratagallia cinerea			2			12			3										17
Aceratagallia No. 1	8	6	3	1	2			2					1						23
Ceratagallia bigeloviae									1										1
Macrosteles fascifrons	2																		2
Macropsis pallida																	9		9
Circulifer tenellus									9										9
Exitanius exitiosus									3										3
Cicadellidae No. 3						1													1
Cicadellidae No. 4	1							1											2
Clastoptera delicata	1																		1
Clastoptera brunnea				4															4
Campylenchia latipes					1														1
Leioscyta ferruginipennis	3	1	79	1			2	176			1								263

TABLE II (continued)

SPECIES OF INSECTS	Chrysnaus EvacCr nBloom	Chrysnaus SoCyn nBloom	Chrysnaus SoCyn Bloom	Artemtriden SoCyn nBloom	Artemludov RagTop nBloom	Atripconfe SoCyn nBloom	Atripcanes SoCyn nBloom	Sarcovermi EvacCr nBloom	Salsokali SoCyn nBloom	Cleomelutea SoCyn Bloom	Melilalba EvacCr Bloom	Tamarpenta RagTop Bloom	Tamarpenta EvacCr Bloom	Rhustrilo RagTop nBloom	Holodmicro RagTop Bloom	Asclecrypt RagTop Bloom	Salixexig WRBr nBloom	Juniposteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	264	50	220	63	69	34	29	437	60	525	61	101	164	33	110	181	140	14	2555
Hysteropterum cornutum				8															8
Prokelisoidea salina																		1	1
Delphacidae No. 1						1		1											2
Pleotrichophorus NA. 1	2	7	14																23
Macrosiphum No. 1	4	2	4																10
Aphalara minutissima				6	9														15
Aphalara artemesiae				2	177														179
Calophya triozomima														78					78
Psyllidae No. 3				1	1														2
Psyllidae No. 5																	4		4
Europiella No. 1			19			1		8		5									33
Parthenicus No. 2			5					6											11
Parthenicus No. 5			3																3
Parthenicus No. 7				2					1										3
Parthenicus No. 8	1				3	2	1												7
Pseudatomoscelis modestus									7										7
Chlamydatus associatus			1								5								6
Slaterocoris flavipes	7																		7
Lopidea media	9		1												3				13
Polymerus diffusus			1																1
Orthotylus No. 2																	2		2
Pilophorus No. 1								1											1
Lygus hesperus		3	2					1	13										19
Mirini No. 1																		4	4
Miridae No. 1									1										1
Miridae No. 2						2			4										6
Miridae No. 6		4																	4
Orius tristicolor			9		2				5	4	3	2			3				28
Nabis alternatus	2	1			1												1		5
Sinea diadema			1																1
Sticlopleura viridicatus													1						1
Lygaeus kalmi													1						1
Nyssius ericae								1											1
Geocoris bullata									2										2
Kleidocerys resedae															4				4
Thyanta punctiventris			1																1
COLEOPETRA																			
Hyperaspis dissoluta																		1	1
Hippodamia convergens										4	2								6
Scymnus rengicus			6					4											10
Systena gracilenta					1														1
Pachybrachys signatus			4					1								3			8
Pachybrachys microptus														1					1
Pachybrachys No. 1	1																		1
Monoxia angularis				1															1
Monoxia elegans						4													4
Paria quadriguttata																	4		4
Crepidodera nana																	1		1

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																		
	Chrysnaus EvacCr nBloom	Chrysnaus SoCyn nBloom	Chrysnaus SoCyn Bloom	Artemtriden SoCyn nBloom	Artemludov RagTop Bloom	Atripconfe SoCyn nBloom	Atripcanes SoCyn Bloom	Sarcovermi EvacCr Bloom	Salsokali SoCyn nBloom	Cleomelutea SoCyn Bloom	Melilalba EvacCr Bloom	Tamarpenta RagTop Bloom	Tamarpenta EvacCr Bloom	Rhustrilo RagTop nBloom	Holodmicro RagTop Bloom	Asclecrypt RagTop Bloom	Salixexig WRBr nBloom	Juniposteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	290	67	291	83	263	44	30	460	93	538	71	103	166	112	120	184	152	20	3087
Longitarsus nitidicollis																	1		1
Phyllotreta No. 1			1	1				1	4								1		8
Ischyropalpus turgidicollis													2		3				5
Notoxus No. 1								1											1
Agrilus malvastri		3																	3
Gnathium No. 1		2																	2
Scopaeus No. 1														1					1
Anaspidinae No. 1	1								3		3				6		1		14
Anaspidinae Ns. 3	1																		1
Cryptorhopalum uteanum	1										4				1				6
Anthrenus lepidus											1								1
Collops No. 1	4		2					1											7
Tanaops No. 1			4						1				7						12
Anthocomus No. 1			1									2							3
Trichochrous No. 1					1														1
Eudastes No. 1													1						1
Stylopidae No. 1		2																	2
Stylopidae No. 2						1													1
Epimechus No. 1	6																		6
Bruchidae No. 4							2												2
MISCELLANEOUS																			
Oelolothrips No. 1	6	2			8				8	4	5								33
Leptothrips No. 1	5						2												7
Frankliniella No. 1	18	19	28		19				4	126	3			17					234
Thysanoptera No. 1							1												1
Thysanoptera No. 2											2				4				6
Acrididae (nymphs)	3	1		3		1	2												10
Oecanthus nigricornis				1	2	1									1				5
Chrysopa No. 1			18								1								19
Chrysopa No. 2			1																1
Perlidae No. 1																	5		5
Microlepidoptera No. 2					18														18
Cercyonis sthenale											1								1
GRAND TOTALS	335	96	346	88	311	47	37	463	113	668	91	105	176	130	135	184	160	20	3505
DIVERSITY	70	30	81	30	43	21	23	41	41	35	51	39	70	17	49	40	24	12	367

TABLE 6

INSECTS PER [redacted] STROKES OF 12-INCH INSECT NET, OIL SHALE TRACTS Ua, Ub, August [redacted] 1976

SPECIES OF INSECTS	SPECIES OF PLANTS, LOCATION, AND BLOOM CONDITION																			
HYMENOPTERA	Chrys naus SoCyn Bud	Chrys naus SoCyn Bloom	Chrys visci SoCyn nBloom	Artem ludov RagTop Bud	Artem tride SoCyn nBloom	Atrip confe SoCyn Bloom	Sarco vermi SoCyn nBloom	Salso kali SoCyn nBloom	Cleome lutea SoCyn Bloom	Clema ligus WRBr Bloom	Tamar penta RagTop Bloom	Amelan utah RagTop nBloom	Gilia calcar RagTop Bloom	Popul fremo WRBr nBloom	Rhus trilo WRBr Bloom	Salix exig WRBr nBloom	Halog glome RagTop nBloom	Junip osteo SoCyn Bloom	ALL
Cyclogastrolla No. 1	3			1															4
Cyclogastrolla No. 5																5			5
Gastancistrus No. 2															4				4
Protolaccus No. 1	1	2																	3
Protolaccus No. 2										1									1
Pseudocatalaccus No. 1									3	1									4
Pseudocatalaccus No. 5										1									1
Hobbya No. 1		3									2								5
Mesopolobus No. 6			1		2		2												5
Pteromalus No. 1													2						2
Habrocytus No. 2		1																	1
Callitula No. 1											1								1
Tetrastichus No. 1		7		3	2		2			2			1	3					20
Tetrastichus No. 5		5																	5
Tetrastichus No. 6									1		2								3
Tetrastichus No. 7		11		1					3							3			18
Tetrastichus No. 11																2			2
Tetrastichus No. 12		2																	2
Euderus No. 1		2								1									3
Euderus No. 2														2					2
Necremnus No. 2											1								1
Eulophidae No. 1								1			1				3				5
Eulophidae No. 2				2		2													4
Eulophidae No. 7				1						1									2
Torymus aenoscapus	1	1																	2
Torymus occidentalis	1																		1
Torymus dasyneuri		1																1	2
Torymus koebelei		2																	2
Pseudotorymus No. 1												1							1
Torymidae No. 1			1								1								2
Bruchophagus No. 2										1									1
Eucharitidae No. 1	1																		1
Perilampus No. 2										3									3
Encyrtidae No. 12												2							2
Eupelmidae No. 1						1													1
Eupelmidae No. 5	1																		1
Mymaridae No. 1		2						2		2						1			7
Mymaridae No. 2										1									1
Trichogrammatidae No. 2			1																1
Platygaster No. 1										1									1
Synopeas No. 1	1	1																	2
Inostemma No. 1		1								1									2
Telenomus No. 1										3						1			4
Telenomus No. 2								1											1
Telenomus No. 3														1					1
Hexacola No. 1								1											1
Kleidotoma No. 1										1									1
Episoda No. 1									1										1
Apanteles No. 1	1										2								3
Apanteles No. 3										1				1					2

SPECIES OF INSECT	SPECIES OF PLANTS, LOCATION, AND BLOOM CONDITION																		
	Chrysnaus SoCyn Bud	Chrysnaus SoCyn Bloom	Chrysvisci SoCyn nBloom	Artemludov RagTop Bud	Artemtriden SoCyn nBloom	Atripconfe SoCyn nBloom	Sarcovermi SoCyn nBloom	Salsokali SoCyn Bloom	Cleomelutea SoCyn Bloom	Clemaligus WRBr Bloom	Tamarpenta RagTop Bloom	Amelanutah RagTop nBloom	Giliacalcar RagTop Bloom	Populfremo WRBr nBloom	Rhustrilo WRBr nBloom	Salixexig WRBr nBloom	Halogglome RagTop Bloom	Juniposteo SoCyn Bloom	ALL
TOTALS BROUGHT FORWARD	10	41	3	8	4	3	4	5	8	21	10	3	3	7	7	12		1	150
Apanteles No. 6												2							2
Opius No. 7										5									5
Bracon No. 5											1								1
Microchelonus No. 4														1					1
Iphiaulax No. 1					1														1
Braconidae No. 1										1									1
Ichneumonidae No. 1										1									1
Formica lasioides	3	17	4	2	2	3	42	7	76										156
Formica No. 2			8																8
Dorymyrmex pyramicus	5		27		5			47	63	4	6			3			2		162
Pogonomyrmex occidentalis													1						1
Monomorium minimum								4											4
Tapinoma sessile								5		2				9					16
Paratiphia No. 1			1																1
Euodynerus annulatus											1								1
Ancistrocerus adiabatus														1					1
Anoplius relativus											1								1
Bembix amoena											1								1
Bembix comata		1																	1
Bembix u-scripta		1																	1
Steniolia elegans		1								2									3
Stictia plana										2									2
Philanthus gibbosus										1									1
Philanthus multimaculatus											1								1
Cerceris californica										1									1
Cerceris rufinoda		1																	1
Isodontia elegans										1									1
Sphex ichneumonius										1									1
Palmodes dimidiatus										1	3								4
Oxybelus parvus										2									2
Oxybelus emarginatus										1	1								2
Oxybelus fossor														1					1
Spilomena No. 1		1																	1
Ammoplanops cockerelli											3			2					5
Mimesa No. 1														1					1
Lindenius columbianus											1								1
Tachysphex propinquus		1																	1
Colletes dissoptus										3									3
Hylaeus cressoni											2								2
Hylaeus stevensi											1								1
Andrena prunorum											1								1
Perdita caloleuca		2							3	16	9			2					32
Perdita zebrata														1					1
Perdita No. 1		1																	1
Dialictus No. 1																	1		1
Dialictus No. 3										4		1	3	1					9
Dialictus No. 6										3									3
Dialictus No. 8									9	4									13
Halictus ligatus										1									1

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																	
	Chrysnaus SoCyn Bud	Chrysnaus SoCyn Bloom	Chrysvisci SoCyn nBloom	Artemludov RagTop Bud	Artemtriden SoCyn nBloom	Atripconfe SoCyn Bloom	Sarcovermi SoCyn Bloom	Salsokali SoCyn nBloom	Cleomelutea SoCyn Bloom	Clemaligus WRBr Bloom	Tamarpenta RagTop Bloom	Amelanutah RagTop nBloom	Giliacalcar RagTop Bloom	Populfremo WRBr nBloom	Rhustrilo WRBr Bloom	Salixexig WRBr Bloom	Halogglome RagTop nBloom	Juniposteo SoCyn Bloom	ALL
TOTALS BROUGHT FORWARD	18	67	43	10	12	6	46	68	159	77	42	6	7	29	7	12	3	1	613
Halictus tripartitus										2									2
Halictus rubicundus		2								1									3
Halictus farinosus											1								1
Lassioglossum sysimbrium										1									1
Evylaeus No. 1										1	1								2
Evylaeus No. 2											1			1					2
Agapostemon femoratus										1									1
Megachile dentitarsis											1								1
Apis mellifera										2									2
Bombus morrisoni											2								2
DIPTERA																			
Hydrobaenus No. 8										5									5
Cricotopus No. 2										9									9
Forcipomyia monilicornis				2															2
Dasyhelea mutabilis									8	12				5					25
Culicoides No. 1										1									1
Probezzia bottimeri										2									2
Leptoconops kerteszi				5						1					1				7
Scatopsidae No. 3										2									2
Bradysia No. 2										1									1
Bradysia No. 3																2			2
Allodia No. 1														1					1
Docisia No. 1										1									1
Simulium griseum		2	1		1									2		2			8
Neolasioptera No. 1	1					2													3
Cecidomyidae No. 1	1			1	2		3												7
Mythicomyia No. 2																1			1
Mythicomyia No. 4									3	8									11
Mythicomyia No. 8										2			4						6
Mythicomyia No. 16										1									1
Oligodranes No. 2													2						2
Phthiria sulphurea		4								3									7
Neacreotrichus No. 1											2								2
Villa lateralis		1																	1
Geron No. 1		2			1					2	5								10
Parasyntormon hinnulus										2									2
Psilocephala aldrichii																		1	1
Phoridae No. 4										4									4
Stilbon No. 1										6									6
Drapetis No. 2										1	1								2
Platypalpus No. 2														12		4			16
Hemerodromiinae No. 1										1									1
Silvius quadrivittatus											1								1
Pipunculus No. 1				1															1
Sargus cuprarius										1									1
Nemotelus politus										7									7
Zodion americanum										2									2
Zodion cinereiventre											1								1
Paragus tibialis										1	1								2

SPECIES	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																		
	Chrysnaus SoCyn Bud	Chrysnaus SoCyn Bloom	Chrysvisci SoCyn Bloom	Artemludov RagTop Bud	Artemtriden SoCyn nBloom	Atripconfe SoCyn nBloom	Sarcovermi SoCyn Bloom	Salsokali SoCyn Bloom	Cleomelutea SoCyn Bloom	Clemaligus WRBr Bloom	Tamarpenta RagTop Bloom	Amelanutah RagTop nBloom	Giliacalcar WRBr Bloom	Populfremo WRBr nBloom	Rhustrilo WRBr nBloom	Salixexig WRBr Bloom	Halogglome RagTop nBloom	Juniposteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	20	78	44	19	16	8	49	68	170	160	59	6	13	50	8	21	3	2	794
Baccha lemur											1								1
Paroxyna clathrata							1							1					2
Trupanea jonesi									1										1
Tephritis araneosa		1														2		1	4
Neaspilota No. 1										1									1
Leucopis No. 1	2	5		2	2		2		6	2			4	1		1			27
Thaumatomyia rubida										1									1
Thaumatomyia glabra										5									5
Conioscinella No. 1										13	6	2							21
Olcella provocans								1			2								3
Siphonella neglecta				1					2	2			2						7
Siphonella No. 1										1									1
Oscinella coxendrix			1							4						3			8
Oscinella frit														1					1
Hippelates pusio										3									3
Meromyza communis										3									3
Aphanotrigonum No. 1										4			1						5
Aphanotrigonum No. 2												1							1
Agromyzidae No. 1										10									10
Cerodontha dorsalis										3						3			6
Phytagromyza No. 4										2									2
Liriomyza No. 2														1					1
Liriomyza No. 5						3													3
Liriomyza No. 6										1									1
Liriomyza No. 7										2									2
Melanagromyza NO. 1														1					1
Desmometopa tarsalis										11									11
Leptometopa halteralis										6	7	1							14
Madiza glabra										2									2
Meoneura polita										1									1
Sepsis No. 1														1					1
Sepsis No. 2										9									9
Euxesta No. 2										1	1								2
Leptocera No. 1						1				2									3
Mosillus tibialis										2									2
Discocerina obscurella										2									2
Hydrochasma buccatum		2								7									9
Psilopa compta										3									3
Allotrichoma No. 1										132									132
Allotrichoma No. 2										24									24
Atissa pygmaea										2									2
Scatella stagnalis										1									1
Phyliqria debilis										2									2
Hydrellia No. 2															1				1
Ephydridae No. 1										1									1
Paradidyma singularis									3										3
Hyalomyia aldrichii										13	3								16
Leucostoma simplex										1									1
Tachinidae No. 1										4									4

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION, AND BLOOM CONDITION																		
	Chrys naus SoCyn Bud	Chrys naus SoCyn Bloom	Chrys visci SoCyn Bloom	Artem ludov RagTop Bud	Artem triden SoCyn nBloom	Atrip confe SoCyn Bloom	Sarco vermi SoCyn Bloom	Salso kali SoCyn nBloom	Cleome lutea SoCyn Bloom	Clema ligus WRBr Bloom	Tamar penta RagTop Bloom	Amelan utah RagTop nBloom	Gilia calcar WRBr Bloom	Popul fremo WRBr nBloom	Rhus trilo WRBr Bloom	Salix exig WRBr nBloom	Halog glome RagTop nBloom	Junip osteo SoCyn Bloom	ALL
TOTALS BROUGHT FORWARD	22	86	45	22	18	12	52	69	182	443	79	10	20	56	9	30	3	3	1161
Tachinidae No. 2										1									1
Phormia regina														1					1
Lucilia No. 1										1									1
Phrosinella pilosifrons		1																	1
Ravinia No. 1										2									2
Metopia argyrocephala										4									4
Senotainia trilineata										3									3
Blaexosipha No. 1										1									1
Taxigramma heteroneura										2									2
Calythia micropteryx										7									7
Hylemya platura										4						1			5
Hylemya cinerella										2									2
Pegomya No. 3										2									2
Fannia No. 1										2									2
Coenosia No. 1										3									3
Muscidae No. 1										1									1
HOMOPTERA-HEMIPTERA																			
Opsius stactogalus								1			19			1					21
Empoasca neaspersa	6	1		2	6														15
Empoasca alboneura	4																		4
Empoasca exigua																8			8
Empoasca typhlocyboides				1	2														3
Mesamia No. 1						1													1
Mesamia NO. 2				1															1
Scaphytopius acutus															1				1
Aceratagallia cinerea		2		2	1	32													37
Aceratagallia No. 1					3	1			2	2		1							9
Aceratagallia No. 3			243																243
Aligia oculea												1							1
Laevicephalus exiguus				2															2
Erythroneura aspera												13							13
Frigartus frigidus					2														2
Circulifer tenellus								36					3				1		40
Aplanus albidus								3											3
Chaitophorus No. 1														2					2
Ballana aris	5		2	2	1	2													12
Ballana (?) No. 1				1															1
Idiocerus rotundus		6																	6
Idiocerus nervatus																7			7
Idiocerus snowi																3			3
Xerophloea peltata				2															2
Prokelisoidea salina									3										3
Clastoptera delicata	4																		4
Oliarus No. 2				1															1
Hysteropterum cornutum					1	4												1	6
Ortheziidae No. 1					4	26	4												34
Palonica No. 1														1					1
Leioscyta ferruginipennis							69												69
Campylenchia latipes				2															2

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION, AND BLOOM CONDITION																		
	Chrysnaus SoCyn Bud	Chrysnaus SoCyn Bloom	Chrysvisci SoCyn Bloom	Artemludov RagTop Bud	Artemtriden SoCyn nBloom	Atripconfe SoCyn Bloom	Sarcovermi SoCyn nBloom	Salsokali SoCyn nBloom	Cleomelutea SoCyn Bloom	Clemaligus WRBr Bloom	Tamarpenta RagTop Bloom	Amelanutah RagTop nBloom	Giliacalcar WRBr Bloom	Populfremo WRBr nBloom	Rhustrilo WRBr Bloom	Salixexig WRBr nBloom	Halogglome RagTop nBloom	Juniposteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	41	96	290	38	38	78	125	109	187	480	98	25	23	61	10	49	4	4	1756
Stictobephala bubalis																5			5
Aphis minuta					4														4
Macrosiphum escalanti		5																	5
Macrosiphum No. 1							3												3
Pleotrichophorus longinectarius	2	2																	4
Pleotrichophorus No. 1		1																	1
Covariella aegypodii																5			5
Rhopalosiphum No. 1																2			2
Epamoebaphis No. 1				4	2														6
Trioza frontalis												29							29
Trioza No. 1												1							1
Trioza NO. 2															1	2			3
Aphalara minutissima			6	146															152
Aphalara artemesiae			4	2															6
Psylla No. 1																9			9
Calophya triozomima															64				64
Chlamydatus associatus								1		3									4
Plagiognathus No. 1												2							2
Lygus hesperus		2						1											3
Pseudatomoscelis modestus								2											2
Parthenicus No. 1						1													1
Parthenicus No. 6	1																		1
Nyssius ericae										14									14
Harmostes reflexulus													1						1
Orius tristicolor	3								4	29									36
Thyanta punctiventris						1													1
Chlorachroa sayi									4										4
Nabis alternatus		1					1												2
Sinea diadema	5						1												6
Sinea undulata			1																1
COLEOPTERA																			
Hippodamia convergens											1			1					2
Hiopodamia apicalis									2										2
Crepidodera nana																2			2
Pachybrachys signatus					1										2				3
Monoxia elegans	4																		4
Monoxia angularis					2	2													4
Epimechus NO. 1			4	2															6
Tanaops No. 2											4								4
Trichochrous No. 1		1																	1
Anaspidinae No. 1									4	5									9
Ischyropalpus turgidicollis											6								6
Cryptorhopalum uteanum											11								11
Staphylinidae No. 1								1											1
Stylopidae No. 1			4			1										1			6
Chrysopa No. 1											2			1		2			5
Leptoceridae No. 1																	2		2
Tortricidae No. 1																		1	1
Frankliniella No. 1		16						2		14	28				14	10			84

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION, AND BLOOM CONDITION																	
	Chrys naus SoCyn Bud	Chrys naus SoCyn Bloom	Chrys visci SoCyn nBloom	Artem ludov RagTop Bud	Artem triden SoCyn nBloom	Atrip confe SoCyn nBloom	Sarco vermi SoCyn nBloom	Salso kali SoCyn nBloom	Cleome lutea SoCyn Bloom	Clema ligus WRBr Bloom	Tamar penta RagTop nBloom	Amelan utah RagTop nBloom	Gilia calcar WRBr Bloom	Popul carfremo WRBr nBloom	Rhus trilo WRBr nBloom	Salix exig WRBr Bloom	Halog glome RagTop nBloom	Junip osteo SoCyn Bloom	ALL
TOTALS BROUGHT FORWARD	56	124	309	192	47	83	130	116	201	545	150	57	24	63	91	87	6	5	2286
Oelolothrips No. 1		4						3		2			4						13
Leptothrips No. 1		2				6		5								3			16
Melanoplus mexicanus	1								4										5
Acrididae (nymph)	4													1		1			6
Oecanthus nigricornis				1								1							2
Sminthuridae No. 1			2		3														5
GRAND TOTAL	61	130	311	193	50	89	130	124	205	547	150	58	28	64	91	91	6	5	2333
DIVERSITY	24	44	16	28	22	17	11	19	21	121	45	13	12	32	9	28	4	5	300
300 SPP.	18	26	21	151	6	11	2	15	18	67	52	33	5	3	81	30	2	1	

TABLE # 7

INS[illegible]PER 50 STROKES OF 12-INCH INSECT NET. OIL SHALE TRACTS UA, UB. SEPT. [illegible], 1976

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																												
HYMENOPTERA	Chrys naus WhRBr Bloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn Bloom	Artem triden SoCyn nBloom	Artem triden WhRBr nBloom	Artem ludov RagTop Bloom	Grin squar WhRBr Bloom	Gutier saroth RagTop Bloom	SarcoAtrip vermiconfe SoCyn Bloom	SoCyn nBloom	Salso kali SoCyn nBloom	Rhus trilo WhRBr nBloom	Rhus trilo RagTop nBloom	Eriog microtexigu WhRBr nBloom	Salix WhRBr Bloom	Tamar penta WhRBr oldBlo	Tamar penta RagTop nBloom	Clema ligus WhRBr Bloom	Lepid mont WhRBr Bloom	Popul fremo WhRBr nBloom	Amela utahe RagTop nBloom	Holod micro RagTop Bloom	Junip osteo SoCyn nBloom	ALL
Halticoptera No. 1	1	26												3			3								33
Halticoptera No. 3	7	18												2			2								29
Cyclogastrolla No. 1	9	3			3	1		4				1		3		1	4		4						33
Cyclogastrolla No. 5	2																								2
Mesopolobus No. 4		1				1																			2
Mesopolobus No. 6	4	8	1											2			5		6						26
Habrocytus No. 1	12	2																							14
Habrocytus No. 2	2																								2
Habrocytus No. 6			1																						1
Pseudocatalaccus No. 1																			3						3
Pseudocatalaccos No. 5	3																								3
Hobbya No. 1														2											2
Pachyneuron No. 1																1									1
Pachyneuron No. 2														1											1
Gastancistrus No. 1															1										1
Gastancistrus No. 5					2	3													5						10
Clorocisturs No. 1			2		2																				4
Protolaccus No. 1		6																							6
Protolaccus No. 2		4																							4
Protolaccus No. 3		1																							1
Eurypteromalus No. 4		2																							2
Euderus No. 1	1	2																		1					4
Eulophidae No. 1	1	1				8	2							10					7						29
Eulophidae No. 2												3													3
Eulophidae No. 4									1													1			2
Eulophidae No. 9	2	4													1				5						12
Eulophidae No. 10																		1							1
Eulophidae No. 11															2										2
Eulophidae No. 14				1											1			1							3
Eulophidae No. 15															1										1
Achrysocharella No. 1															2				3						5
Tetrastichus No. 1		4			1									19		1									25
Tetrastichus No. 5				2																					2
Tetrastichus No. 6	3	3				2								4		1									13
Tetrastichus No. 7	11	5			2	1											2								21
Tetrastichus No. 12	1				1																				2
Tetrastichus No. 18															4										4
Diglyphus No. 1				1	1																				2
Diglyphus No. 2	3	2																							5
Necremnus No. 2		1																							1
Pnigalio No. 1								1			1		1	1											4
Pnigalio No. 2															1										1
Encyrtus No. 1	74	62								1		3		2	1	4	196		16						357
Encyrtus No. 2								1		1										7					11
Encyrtus No. 3	1																			1			1		3
Encyrtidae No. 4											1														1
Encyrtidae No. 5		1														2									3
Encyrtidae No. 6	1																								1
Encyrtidae No. 7																				1					1

SPECIES OF INSECT	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																								
	Chrys naus WhRBr Bloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn Bloom	Artem tridentiSoCyn nBloom	Artem triden WhRBr nBloom	Artem ludov RagTop nBloom	Grin squar WhRBr Bloom	GutierSarothvermi RagTop Bloom	Sarco SoCyn Bloom	Atrip confe SoCyn nBloom	Salso kali SoCyn nBloom	Rhus trilo WhRBr nBloom	Rhus trilo RagTop nBloom	Eriog microtexigu WhRBr nBloom	Salix WhRBr nBloom	Tamar penta WhRBr oldBlo	Tamar penta RagTop nBloom	Clema ligus WhRBr nBloom	Lepid mont WhRBr nBloom	Popul fremo WhRBr nBloom	Amela utahe RagTop nBloom	Holod micro RagTop nBloom	Junip osteo SoCyn nBloom	ALL
TOTALS BROUGHT FORWARD	138	156	4	4	20	10		6	1	2	2	7	1	49	14	10	212	2	49	10		1	1	699
Encyrtidae No. 8														1										1
Perilampus No. 1	1						1																	2
Eurytomidae No. 3															1									1
Torymus koebelei	1				1									3					2					7
Torymus aenoscapus																	5							5
Torymus kinseyi														2										2
Pseudotorymus No. 1																	1							1
Mymaridae No. 1	7	1				1								1			1	2	1					14
Mymaridae No. 3															2									2
Bruchophagus No. 1	5	1																						6
Eupelmidae No. 1	4														1									5
Eupelmidae No. 2	2																							2
Eupelmidae No. 3	1																							1
Trichogrammatidae No. 1														1	1									2
Trichogrammatidae No. 2														1										1
Schwarziella No. 1												1												1
Ceraphronidae No. 1																		2						2
Platygaster No. 1	12	7			4									3					2					28
Synopeas No. 1														4										4
Synopeas No. 2	19	14		6	14						1													54
Synopeas No. 3				12																				12
Inosterma No. 1	2	4																						6
Gyron No. 1															1									1
Telenomus No. 1								1						1			2					1		5
Telenomus No. 2	2	9																			1			12
Telenomus No. 3	1																							1
Telenomus No. 4		2				1																		3
Dissolcus No. 1	1																							1
Trissolcus utahensis	1													1										2
Dendrocerus No. 1	2																							2
Cothonaspis No. 1																			1					1
Allotria No. 1		1			1	2																		4
Apanteles No. 1	2							1																3
Apanteles No. 2						1			2								1							4
Apanteles No. 4		1													2									3
Apanteles No. 5	4	5																						9
Apanteles No. 6														4										4
Agathis brevicornis								1											1					2
Agathis nigripes	1	4	2									1												8
Microchelonis No. 4																			1					1
Microchelonis No. 1				1	5									1										7
Chelonis sericeus	5																							5
Opius No. 4																		1						1
Bracon hyslopi							4																	4
Bracon No. 4	1																							1
Braconidae No. 2																	1							1
Lysiphlebus testaceipes	1																							1
Trioxys bonnevillensis		1			3	1																		5

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																								
	Chrysnaus WhRBr Bloom	Chrysnaus SoCyn Bloom	Chrysvisci SoCyn Bloom	Artemtriden SoCyn Bloom	Artemtriden WhPBr nBloom	Artemludov RagTop Bloom	Grinsquar WhRBr Bloom	Gutiersaroth RagTop Bloom	Sarcovermi SoCyn Bloom	Atripconfe SoCyn nBloom	Salsokali SoCyn nBloom	Phustrilo WhRBr nBloom	Rhustrilo RagTop nBloom	Eriogmicrotexigu WhPBr nBloom	Salix WhRBr Bloom	Tamarpentaold WhRBr Bloom	Tamarpenta RagTop nBloom	Clematligus WhRBr Bloom	Lepidmont WhRBr nBloom	Populfremo WhRBr nBloom	Amelautahe RagTop nBloom	Holodmicro RagTop nBloom	Juniposteo SoCyn Bloom	ALL
TOTALS BROUGHT FORWARD	213	206	6	23	48	16	5	9	3	2	3	9	1	72	22	10	223	7	57	10	1	2	1	949
Mirax No. 1												1												1
Ichneumonidae No. 1																2								2
Ichneumonidae No. 2																2								2
Ichneumonidae No. 3																1								1
Ichneumonidae No. 4		1																						1
Ichneumonidae No. 5		1																						1
Dorymyrmex pyramicus	3		3		6		2		9	2		2			27		2	5	2		2			65
Formica lasioides	15		6	3	1	3				1	2	1		1	8	5			5	3				54
Formica No. 2																			2					2
Pogonomyrmex occidentalis											1			1										2
Lasius niger	2																							2
Tapinoma sessile						2			2										2	3	6			15
Epyrus rufipes																1								1
Spilomena No. 1	5	9	1					1						1			1		9		1			28
Spilomena No. 2	1																							1
Oxybelus emarginatus																			1					1
Diodontus No. 2																			1					1
Lindenius columbianus	1															1								2
Philanthus gibbosus															1									1
Philanthus multimaculatus												1												1
Colletes dissoptus	2				1																			3
Colletes simulans	1																							1
Dialictus No. 2					1									2		3			1					7
Dialictus No. 3												1												1
Dialictus No. 7	2																		2					4
Dialictus No. 8								1						22					7					30
Evylaeus NO. 1	1																							1
Agapostemon femoratus	2																							2
Nomia melanderi	2																							2
Halictus tripartitus																			1					1
Perdita tortifolia					1														2					3
Perdita similis	5													21										26
Perdita nuda							3																	3
Perdita salicis															1									1
Perdita rectangularis	4																							4
Perdita caloleuca	3													3										6
Perdita No. 1	176				1									531										708
Nomadopsis scitulae																			7					7
Andrena ramaleyi	1																							1
Anthophora maculifrons	8																							8
Melissodes glenwoodensis	1																							1
Melissodes subagilis	2						1																	3
Diadasia enavata							1																	1
Neolarra No. 1														1										1
Megachile nevadensis	2																							2
Megachile perihirta	1																							1
Dianthidium curvatum							1																	1
Apis mellifera	30				1		1								1	4			1					38

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																								
	Chrys naus WhRBr Bloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn Bloom	Artem tridentriden SoCyn nBloom	Artem WhRBr Bloom	Artem ludov RagTop nBloom	Grin squar WhRBr Bloom	Gutier saroth RagTop Bloom	Sarco vermi SoCyn Bloom	Atrip confe SoCyn Bloom	Salso kali SoCyn nBloom	Rhus trilo WhRBr Bloom	Rhus trilo RagTop nBloom	Erino microtexigu WhRBr nBloom	Salix WhRBr Bloom	Tamar penta WhRBr oldBlop	Tamar penta RagTop Bloom	Clema ligus WhRBr nBloom	Lepid mont WhRBr Bloom	Popul fremo WhRBr nBloom	Amela utahe RagTop nBloom	Holod micro RagTop nBloom	Junip osteo RagTop Bloom	ALL
TOTALS BROUGHT FORWARD	483	217	16	26	60	21	14	11	14	5	6	15	1	655	60	29	226	12	100	16	10	2	1	2000
Bombus morrisoni	2																							2
Hydrobaenus No. 4					24										3	1500		11						1538
Hydrobaenus No. 8	12				16	3						4			6	143		13	4					201
Cricotopus No. 1	4				8	1						6			16	4	2	6	3	1				51
Cricotopus No. 2					1									1	4	26	5	3	2					42
Cricotopus No. 3					6							2			2									10
Chironomus No. 1															1									1
Chironomus No. 2	2				4							2				7		2	1					18
Dasyhelea mutabilis					38	5											9	5			6			63
Dasyhelea No. 1														8					2	1				11
Leptoconops kerteszi									4			8							3					15
Probezzia bottimeri												2												2
Simulium griseum		4							1	3	1	1	1	2	1	4	7	2						27
Bradysia No. 1																			1	1				2
Sciaridae No. 1																1								1
Cecidomyidae No. 1					7	4													1					12
Cecidomyidae No. 2								5																5
Ledomyia No. 1			2																					2
Platypalpus No. 2						1	1													1				3
Empididae No. 1															1									1
Empididae No. 2														1										1
Psilocephala aldrichii												1					2							3
Neachreotrichus No. 1	1	8	1																					10
Poecilanthrax willistoni	1																						1	2
Phthirius No. 2		2						1																3
Phthirius No. 9								1		1														2
Oligodranes No. 1		1																						1
Mythicomya No. 2						1													7					8
Mythicomya No. 6														1										1
Mythicomya No. 7														2										2
Mythicomya No. 8														2					1					3
Phoridae No. 1																	1							1
Phoridae No. 2						1	1																	2
Pipunculus No. 1	1																							1
Paragus bicolor														1										1
Syritta pipiens																			1					1
Asteia multipunctata							2																	2
Liriomyza No. 7		2																						2
Agromyzidae No. 1																		1						1
Paroxyna clathrata	3	9		2		2		1						5			4							26
Tephritis araneosa						1													1					2
Trupanea jonesi		1	1											3					1					6
Trupanea bisetosa	1			1		1								1		1								4
Leucopis No. 1	1	1												1	7	2	3							15
Meromyza No. 1	1	7						1		1				6			6							22
Olcella provocans	8	6	1								4			1			2		2			1		25
Olcella No. 1	2	1																						3
Oscinella coxendrix	1																							1

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																							
	Chrys naus WhRBr Bloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn Bloom	Artem tridentn SoCyn Bloom	Artem tridentn WhRBr Bloom	Artem ludov RagTop Bloom	Grin squar WhRBr Bloom	Gutier saroth RagTop Bloom	Sarco vermi SoCyn Bloom	Atrip confe SoCyn Bloom	Salso kali SoCyn Bloom	Rhus trilo WhRBr Bloom	Rhus trilo RagTop Bloom	Eriog microtexigu WhRBr Bloom	Salix WhRBr Bloom	Tamar penta WhRBr old Bloom	Tamar penta RagTop Bloom	Clema ligus WhRBr Bloom	Lepid mont WhRBr Bloom	Popul fremo WhRBr Bloom	Amela utahe RagTop Bloom	Holod micro RagTop Bloom	Junip osteo RagTop Bloom	ALL
TOTALS BROUGHT FORWARD	523	259	21	29	164	41	18	20	19	10	11	41	2	689	101	1717	267	55	130	20	16	3	2	4158
Conioscinella No. 1		1				1			1					1				1						5
Siphonella neglecta														3										3
Siphonella No. 1	4	1																	3					8
Hippelates pusio	1													2										3
Thaumatomyia glabra																		1						1
Leptometopa halteralis														1						1				2
Sepsis No. 1	1													1			1							3
Psilopa compta																		1						1
Phyligria debilis										1	2													3
Allotrichoma No. 1	1																							1
Mosillus tibialis	1															2								3
Hyadina pruinosa	1																							1
Atissa pygmaea	1																							1
Dasiops No. 1																		2						2
Tethinidae No. 1															1	1								2
Calliphora coloradensis														1										1
Phaenicia sericata																		1						1
Paradidyma singularis														2										2
Hyalomya aldrichii																1	1							2
Tachinidae No. 1															1									1
Amobia floridensis														1										1
Ptychoneura aristalis																			1					1
Miltogrammini No. 1																		1						1
Sarcophaga bullata																1								1
Blesophix inerminieri																		1						1
Hylemya platura								4								1								5
Hylemya neomexicana																		1						1
Anthomyiidae No. 1											1					1								2
Limosia No. 2																			2					2
HOMOPTERA - HEMIPTERA																								
Opsius stactogallus	2				1	2									1	862	468	3						1339
Empoasca neaspersa	8	6		5	14	26	1	3																63
Empoasca alboneura	4	1					2	2																9
Empoasca typhlocyboides					130	18																		154
Empoasca exiguae															4									4
Empoasca No. 2															2									2
Empoasca No. 3					2																			2
Macrosteles fascifrons	2				1	3																		6
Stragania grandis		2	2					6																10
Cicadellidae No. 1				2				1																3
Cicadellidae No. 4														1										1
Aceratagallia cinerea					1					16														17
Aceratagallia uhleri		2																						2
Aceratagallia No. 1			7		2	4																		13
Aceratagallia No. 2	1																							1
Aplanus albidus										1														1
Hebecephalus No. 1														6										6
Xerophloea peltata			1				1																	2

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																										
	Chrysnaus WhRBr Bloom	Chrysnaus SoCyn Bloom	Chrysvisci SoCyn Bloom	Artemtriden SoCyn Bloom	Artemtriden WhRBr Bloom	Artemludov RagTop Bloom	Grinsquar WhRBr Bloom	Gutiersaroth RagTop Bloom	Sarcovermi SoCyn Bloom	Atripconfe SoCyn Bloom	Salsokali SoCyn Bloom	Rhustrilo WhRBr Bloom	Rhustrilo RagTop Bloom	Eriogmicrotexigu WhRBr Bloom	Salix WhRBr Bloom	Tamarpenta WhRBr Bloom	Tamarpenta RagTop Bloom	Clemaligus WhRBr Bloom	Lepidmont WhRBr Bloom	Populfremo WhRBr Bloom	Amelautahe RagTop Bloom	Holodmicro RagTop Bloom	Juniposteo RagTop Bloom	A
TOTALS BROUGHT FORWARD	550	272	31	36	321	95	22	36	20	28	14	41	2	708	110	2586	737	67	136	21	16	3	2	5
Pachyopsis laetus												1												
Scaphytopius acutus												1						1						
Acinopterus No. 1			1																					
Ballana aris			1																					
Idiocerus snowi															3									
Idiocerus nervatus															1									
Idiocerus morosus															1									
Idiocerus rametosus															1								1	
Exitianus exitiosus															1									
Scleroracus plutonius																		1						
Erythroneura aspera																						76		
Circulifer tenellus	4			1						1	12			2					1					
Aphalara No. 1				2		4																		
Callophya triozomima												37	5								5			
Hysteropterum cornutum			1	3																				
Pissonotus delicatus							64																	
Scolops pallida			1																					
Stictocephala bubalis															2									
Clastoptera delicata					6	2																		
Pleotrichophorus packi	4																							
Epameobaphis No. 1				3	29	6																		
Braggia echinata														126										
Aphis No. 1	6																							
Aphis No. 2														2										
Macrosiphum No. 1																			2					
Polymerus diffusus		1																						
Lygus hesperus	1	4												10										
Dereocoris triannulipes	1																							
Phytocoris No. 4			4					1																
Lopidea media				2		1																		
Miridae No. 1																						3		
Miridae No. 3											2													
Miridae No. 4					5	9				14														
Parthenicus No. 1															1									
Parthenicus No. 6			1										1						1					
Chlamydatus associatus							2																	
Pseudatomoscelis modestus														2										
Orius tristicolor	11	20			13	4	3					3		7					104					
Nyssius ericae	9						1																	
Geocoris bullatus	3	3						1						2					14					
Lygaeus kalmii		1																						
Sphragisticus nebulosus															1									
Nabis alternatus	1	3				1																		
Stictophleura viridicata					3																			
Liorhyssus hyalinus						1								2										
Phymata fasciata		2	1				1							1										
COLEOPTERA																								
Brumoides septentrionis														1										

SPECIES OF INSECTS	SPECIES OF PLANT, LOCATION AND BLOOM CONDITION																							
	Chrys naus WhRBr Bloom	Chrys naus SoCyn Bloom	Chrys visci SoCyn Bloom	Artem triden SoCyn nBloom	Artem triden WhRBr Bloom	Artem ludov RagTop nBloom	Grin squar WhRBr Bloom	Gutier saroth RagTop Bloom	Sarco vermi SoCyn Bloom	Atrip confe SoCyn nBloom	Salso kali SoCyn nBloom	Rhus trilo WhRBr nBloom	Rhus trilo RagTop nBloom	Eriog microtexigu WhRBr nBloom	Salix WhRBr Bloom	Tamar penta WhRBr pldBlon	Tamar penta RagTop Bloom	Clema ligus WhRBr nBloom	Lepid mont WrRBr nBloom	Popul fremo WhRBr nBloom	Amela utahe RagTop nBloom	Holod micro RagTop Bloom	Junip osteo RagTop nBloom	ALL
TOTALS BROUGHT FORWARD	590	314	41	47	377	123	93	38	20	43	28	83	8	863	121	2586	737	69	258	21	21	82	3	6566
Hyperaspis lateralis					2																			2
Hyperaspis dissoluta																						3		3
Scymnus renoicus	2	1				1								2										6
Scymnus nugator																				1				1
Paria quadriguttata															3									3
Crepidoderus nana															2									2
Monoxia puberula							11																	11
Monoxia angularis				4	63	13				1														81
Monoxia elegans										1														1
Monoxia sordida																			1					1
Phyllotreta No. 1																			46					46
Psyllioides No. 1						2													2					4
Tychius No. 1		1						1																2
Apion No. 1														1										1
Epimechus No. 1	3	2	8			1		3																17
Epimechus No. 2		3																						3
Curculionidae No. 1	2																							2
Phalacrus No. 1		2																						2
Crossidius coralinus	2																							2
Nemognatha immaculata							1																	1
Trichochrous No. 1	3																							3
Coliops No. 1	1																							1
MISCELLANEOUS																								
Chrysopa No. 1					3	1									1					3				8
Leptoceridae No. 1															3					1				4
Frankliniella No. 1							67					9		28		74			246					424
Oelolothrips No. 1							46							1					16					63
GRAND TOTALS	603	323	49	51	445	141	218	42	20	45	28	92	8	895	130	2660	737	69	569	26	21	85	3	7260
DIVERSITY	103	64	24	17	44	42	23	22	7	14	11	23	4	71	46	31	27	25	53	14	6	6	3	314

List of Insects

LIST OF INSECTS IN TABLES 4 - 37

	JUNE	JULY	AUG.	SEPT.
HYMENOPTERA				
CHALCIDOIDEA				
PTEROMALIDAE				
Callitula No. 1		X	X	
Chlorocistrus No. 1		X		X
Chlorocistrus No. 3		X		
Cyclogastrolla No. 1	X	X	X	X
Cyclogastrolla No. 5	X	X	X	X
Eurupteromalus No. 4				X
Habrocytus No. 1		X		X
Habrocytus No. 2	X		X	X
Habrocytus No. 3	X			
Habrocytus No. 4		X		
Habrocytus No. 5	X			
Habrocytus No. 6	X	X		X
Halticoptera No. 1		X		X
Halticoptera No. 2		X		
Halticoptera No. 3				X
Halticoptera No. 6	X			
Gastrancistrus No. 1	X	X		X
Gastrancistrus No. 2	X	X	X	X
Gastrancistrus No. 3	X			
Gastrancistrus No. 4	X	X		
Hobbya No. 1		X	X	X
Homoporus No. 1		X		
Mesopolobus No. 1	X			
Mesopolobus No. 4				X
Mesopolobus No. 6	X	X	X	X
Pachyneuron No. 1	X			X
Pachyneuron No. 2	X		X	
Protolaccus No. 1	X		X	X
Protolaccus No. 2		X	X	X
Protolaccus No. 3				X
Pseudocatalaccus No. 1			X	X
Pseudocatalaccus No. 4		X		
Pseudocatalaccus No. 5	X	X	X	X
Psilocerus No. 1	X	X		
Pteromalus No. 1			X	
Rhizomalus No. 1	X			
EULOPHIDAE				
Achrysocharella No. 1		X		X
Closterocerus No. 1		X		
Diglyphus No. 1	X			X
Diglyphus No. 2				X
Entedon bigeloviae		X		
Euderus No. 1		X	X	X
Euderus No. 2			X	
Eulophidae No. 1		X	X	X
Eulophidae No. 2	X		X	X
Eulophidae No. 4				X
Eulophidae No. 7	X	X	X	
Eulophidae No. 9	X	X		X
Eulophidae No. 10				X
Eulophidae No. 11				X
Eulophidae No. 14				X
Eulophidae No. 15				X
Necremnus No. 1		X		
Necremnus No. 2			X	X
Pnigalio No. 1		X		X
Pnigalio No. 2				X
Tetrastichus No. 1	X	X	X	X
Tetrastichus No. 2		X		
Tetrastichus No. 4	X			
Tetrastichus No. 5	X	X	X	X
Tetrastichus No. 6	X	X	X	X
Tetrastichus No. 7	X	X	X	X
Tetrastichus No. 11		X	X	
Tetrastichus No. 12		X	X	X
Tetrastichus No. 13		X		
Tetrastichus No. 14		X		
Tetrastichus No. 18				X
Tetrastichus No. 19		X		
Tetrastichus No. 20		X		
Zagogramminae No. 1	X	X		
ENCYRTIDAE				
Encyrtidae No. 3		X		
Encyrtidae No. 4				X
Encyrtidae No. 5		X		X
Encyrtidae No. 6	X			X
Encyrtidae No. 7				X
Encyrtidae No. 8				X
Encyrtidae No. 9	X			

	JUNE	JULY	AUG.	SEPT.
Encyrtidae No. 10		X		
Encyrtidae No. 11			X	
Encyrtidae No. 12				X
Encyrtus No. 1	X	X		X
Encyrtus No. 2				X
Encyrtus No. 3				X
EUROTOMIDAE				
Bruchophagus No. 1	X	X		X
Bruchophagus No. 2			X	
Eurytoma No. 1	X	X		
Eurytoma No. 2		X		
Eurytoma No. 5		X		
Eurytomidae No. 3				X
Megastigmus No. 1		X		
Megastigmus No. 3		X		
Rileya No. 1		X		
TORYMIDAE				
Pseudotorymus No. 1		X	X	X
Torymidae No. 1			X	
Torymus aea	X			
Torymus aenoscapus	X	X	X	X
Torymus albitarsus	X	X		
Torymus dasyneuri	X		X	
Torymus kinseyi		X		X
Torymus koebelei	X	X	X	X
Torymus occidentalis			X	
Torymus No. 1		X		
Torymus No. 2	X			
Torymus No. 3		X		
MYMARIDAE				
Mymaridae No. 1	X		X	X
Mymaridae No. 2		X	X	
Mymaridae No. 3				X
EUPELMIDAE				
Eupelmidae No. 1	X	X	X	X
Eupelmidae No. 2		X		X
Eupelmidae No. 3				X
Eupelmidae No. 4		X		
Eupelmidae No. 5		X	X	
TRICHOGRAMMATIDAE				
Trichogrammatidae No. 1				X

	JUNE	JULY	AUG.	S
Trichogrammatidae No. 1				
Trichogrammatidae No. 2	X		X	
Trichogrammatidae No. 3		X		
Trichogrammatidae No. 4		X		
EUCHARITIDAE				
Eucharitidae No. 1		X		
PERILAMPIDAE				
Perilampus No. 1		X		
Perilampus No. 2		X	X	
CHALCIDIDAE				
Brachymena tegularis		X		
Chalcididae No. 1		X		
Hypotheracinae No. 1		X		
Schwarziella No. 1				
Spilochalcis sidae		X		
LEUCOSPIDAE				
Leucospis affinis		X		
ELASMIDAE				
Elasmus No. 1		X		
PROCTOTRUPOIDEA				
PLATYGASTERIDAE				
Inostemma No. 1	X	X	X	
Metaclisis No. 1	X			
Platygaster utahensis	X	X		
Platygaster No. 1		X	X	
Platygaster No. 3	X			
Synopeas No. 1			X	
Synopeas No. 2	X			
Synopeas No. 3				
Synopeas No. 4		X		
SCELIONIDAE				
Dissolcus No. 1	X			
Gyron pennsylvanicus	X			
Gyron No. 1				
Scelionidae No. 1		X		
Telenomus No. 1	X	X	X	
Telenomus No. 2		X	X	
Telenomus No. 3	X		X	
Telenomus No. 4				
Trissoleus utahensis	X	X		
CERAPHRONIDAE				
Ceraphronidae No. 1				

CYNIPOIDEA				
CYNIPIDAE				
Allotria No. 1	X	X		X
Aporencoela No. 1		X		
Cothonaspis No. 1		X		X
Dendrocerus No. 1				X
Episoda No. 1		X	X	
Hexacola No. 1			X	
Hypodiranchus No. 2		X		
Kleidotoma No. 1			X	
ICHNEUMONOIDEA				
BRACONIDAE				
Agathis brevicornis				X
Agathis nigripes				X
Apanteles No. 1	X	X	X	
Apanteles No. 3			X	
Apanteles No. 6	X		X	
Apanteles No. 8		X		
Bracon gelechiae		X		
Bracon hyslopi				X
Bracon No. 4				X
Bracon No. 5		X	X	
Bracon No. 8	X			
Braconidae No. 1			X	
Braconidae No. 2		X		X
Chelonus sericeus				X
Iphiaulax No. 1	X		X	
Lysiphlebus testaceipes	X	X		X
Meteorus laeviventris		X		
Microchelonus No. 1				X
Microchelonus No. 2	X			
Microchelonus No. 4			X	X
Microchelonus No. 6		X		
Mirax No. 1	X			X
Mirax No. 2		X		
Opius No. 2		X		
Opius No. 4		X		
Opius No. 6		X		
Opius No. 7			X	
Parahormius No. 1		X		
Trioxys bonnevillensis		X		X
ICHNEUMONIDAE				
Ichneumonidae No. 1			X	X
Ichneumonidae No. 2				
Ichneumonidae No. 3				
Ichneumonidae No. 4	X			
Ichneumonidae No. 5				
Ichneumonidae No. 6	X			
Ichneumonidae No. 8		X		
Ichneumonidae No. 10		X		
SCOLIOIDEA (inc. "TIPHIOIDEA")				
FORMICIDAE				
Dorymyrmex pyramicus	X	X		X
Formica lasiodes	X	X		X
Formica No. 1		X		
Formica No. 2				X
Lasius niger	X			
Monomorium minimum	X			X
Pogonomyrmex occidentalis	X			X
Tapinoma sessile	X	X		X
TIPHIIDAE				
Paratiphia No. 2		X		X
VESPOIDEA				
VESPIDAE				
Polistes centralis		X		
EUMENIDAE				
Ancistrocerus tuberculocephalus		X		
Ancistrocerus adiabatus				X
Eumenes bollii		X		
Euodynerus annulatus		X		X
Microdynerus bakerianus		X		
Stenodynerus apache		X		
Stenodynerus blandoides		X		
BETHYLOIDEA (inc. "DRYINOIDEA")				
BETHYLIDAE				
Epyrus rufipes				
DRYINIDAE				
Dryinidae No. 1	X			
SPHECOIDEA				
POMPILIDAE				
Anoplius relativus				X
SPHECIDAE				
Ammophila aberti		X		

Ammophila cleopatra		X		
Ammoplanops cockerelli	X	X	X	
Bembix amoena			X	
Bembix comata			X	
Bembix U-scripto			X	
Bicyrtes ventralis		X		
Cerceris californica		X		
Cerceris conifrons		X		
Cerceris convergens		X		
Cerceris rufinoda			X	
Crabro pallida	X			
Diodontus No. 2		X		X
Dryudella kohli		X		
Eucerceris vittatifrons		X		
Isodontia elegans			X	
Lindenius columbianus			X	X
Lindenius No. 1	X			
Microbembex monodonata		X		
Microbembex No. 1		X		
Mimesa No. 1			X	
Ochleroptera bipunctata	X			
Oxybelus emarginatus		X	X	X
Oxybelus fossor		X	X	
Oxybelus packardii		X		
Oxybelus parvus		X	X	
Oxybelus uniglumis		X		
Palmodes dimidiatus	X	X	X	
Philanthus gibbosus			X	X
Philanthus multimaculatus		X	X	X
Philanthus pacificus		X		
Podalonia luctuosa	X			
Pulverro No. 1	X	X		
Sphex ichneumonius			X	
Spilomena No. 1	X	X	X	X
Spilomena No. 2		X		X
Steniolia elegans			X	
Stictia plana			X	
Stizoides unicinctus		X		
Tachysphex ashmeadii		X		
Tachysphex propinquus			X	
Tachytes sayi		X		

APOIDEA				
COLLETIDAE				
Colletes dissoptus		X	X	X
Colletes simulans				X
Hylaeus crossoni	X		X	
Hylaeus stevensi		X	X	
ANDRENIDAE				
Andrena prunorum			X	
Andrena ramaleyi				X
Nomadopsis scitulae		X		X
Perdita caloleuca		X	X	X
Perdita nuda				X
Perdita rectangularis				X
Perdita salicis				X
Perdita similis				X
Perdita tortifolia				X
Perdita zebrata			X	
Perdita No. 1			X	X
HALICTIDAE				
Agapostemon femoratus			X	X
Agapostemon texanus	X			
Dialictus No. 1	X	X	X	
Dialictus No. 2		X		X
Dialictus No. 3		X	X	X
Dialictus No. 6			X	
Dialictus No. 7				X
Dialictus No. 8	X	X	X	X
Dialictus No. 10	X			
Dialictus No. 12		X		
Evylaeus No. 1	X		X	X
Evylaeus No. 2			X	
Evylaeus No. 5		X		
Halictus farinosus			X	
Halictus ligatus		X	X	
Halictus rubicundus			X	
Halictus tripartitus	X		X	X
Halictus virgatellus		X		
Lasioglossum sysimbrium			X	
Nomia melanderi				X
Sphecodes No. 1		X		
ANTHOPHORIDAE				
Anthophora maculifrons				X

Diadasia enavata		X		X
Melissodes glenwoodensis				X
Melissodes subagilis		X		X
Neolarra No. 1				X
Neolarra No. 2		X		
Triepeolus No. 1		X		
MEGACHILIDAE				
Dianthidium curvatum				X
Megachile dentitarsis			X	
Megachile nevadensis				X
Megachile perihirta				X
Megachile subexilis		X		
Megachile texana		X		
APIDAE				
Apis mellifera		X		X
Bombus morrisoni		X		X
DIPTERA				
NEMATOCERA				
CHIRONOMIDAE				
Chironomus No. 1				X
Chironomus No. 2	X	X		X
Chironomus No. 3		X		
Cricotopus No. 1	X			X
Cricotopus No. 2	X	X	X	X
Cricotopus No. 3				X
Hydrobaemus No. 1	X	X	X	
Hydrobaemus No. 3		X		
Hydrobaemus No. 4	X			X
Hydrobaemus No. 8	X	X		X
Hydrobaemus No. 9	X			
Microtendipes No. 1	X			
Tanypodinae No. 1	X			
CERATOPOGONIDAE				
Culicoides palmeri		X		
Culicoides (Selfia) No. 1	X		X	
Dasyhelea mutabilis	X	X	X	X
Dasyhelea No. 1		X		X
Forcipomyia No. 1			X	
Leptoconops kerteszi	X	X		
Leptoconops torrens	X	X		
Probezzia bottimeri			X	X
SIMULIIDAE				
Simulium griseum	X	X	X	X
Simulium No. 1		X		
SCIARIDAE				
Bradysia No. 1	X			X
Bradysia No. 2	X		X	
Bradysia No. 3			X	
Sciaridae No. 1				X
MYCETAPHILIDAE				
Mycetophilidae No. 1	X			
CECIDOMYIDAE				
Allodia No. 1			X	
Cecidomyidae No. 1			X	X
Cecidomyidae No. 2				X
Docisia No. 1			X	
Ledomyia No. 1		X		
Nealasioptera No. 1	X	X	X	
Rhopziomyia No. 1		X		
CULICIDAE				
Aedes vexans	X			
Aedes melanimon	X			
SCATOPSIDAE				
Scatopsidae No. 3			X	
BRACHYCERA				
EMPIDIDAE				
Drapetis No. 2	X	X	X	
Empididae No. 1				X
Empididae No. 2				X
Hemerodromiinae No. 1			X	
Medetera No. 1	X	X		
Platypalpus No. 2	X	X	X	X
Stilbon No. 1			X	
THEREVIDAE				
Psilocephala aldrichii			X	X
BOMBYLIIDAE				
Geron No. 1	X	X	X	
Mythicomyia atra	X	X		
Mythicomyia No. 1		X		
Mythicomyia No. 2		X	X	X
Mythicomyia No. 3	X	X		
Mythicomyia No. 4	X	X	X	
Mythicomyia No. 5				X

Mythicomyia No. 6	X	X		
Mythicomyia No. 7	X			X
Mythicomyia No. 8	X	X	X	X
Mythicomyia No. 9		X		
Mythicomyia No. 10	X	X		
Mythicomyia No. 13		X		
Mythicomyia No. 16			X	
Neachreotrichus No. 1		X	X	X
Oligodranes No. 1				X
Oligodranes No. 2		X	X	
Oligodranes No. 3	X			
Oligodranes No. 4		X		
Parasynthormon hinnulus			X	
Phthiria sulphurea			X	
Phthiria No. 2				X
Phthiria No. 4		X		
Pthiria No. 9				X
Poecilanthrax willistoni				X
Prorates claripennis		X		
Villa lateralis			X	
Villa No. 2		X		
DOLICHOPODIDAE				
Chrysotus picticornis		X		
PHORIDAE				
Phoridae No. 1		X		X
Phoridae No. 2		X		X
Phoridae No. 4			X	
SCENOPINIDAE				
Scenopinidae No. 1	X	X		
Scenopinidae No. 3		X		
STRATIOMYIDAE				
Nemotelus politus	X		X	
Sargus cuprarius			X	
TABANIDAE				
Apatolestes comastes		X		
Silvius quadrivittatus		X	X	
SYRPHIDAE				
Baccha lemur			X	
Mesogramma marginata		X		
Paragus bicolor				X
Paragus tibialis		X	X	
Syritta pipiens				X
PIPUNCULIDAE				
Pipunculus No. 1	X		X	X
Pipunculus No. 2		X		
CONOPIDAE				
Thecophora propinqua		X		
Zodion americanum		X	X	
Zodion cinereiventre			X	
ACALYPTERATA				
TEPHRITIDAE				
Euaresta tapetis		X		
Neaspilota No. 1	X	X	X	
Oxyna palpalis	X			
Paroxyna clathrata	X	X	X	X
Proceridochares minuta		X		
Tephritis araneosa	X	X	X	X
Trupanea jonesi		X	X	X
Trupanea bisetosa	X	X		X
Trupanea nigricornis		X		
CHAMAEMYIIDAE				
Chamaemyia No. 1	X			
Leucopis No. 1	X	X	X	X
Leucopis No. 2	X	X		
ASTEIIDAE				
Asteia multipunctata	X	X		X
CHLOROPIDAE				
Aphanotrigonum No. 1	X	X	X	
Aphanotrigonum No. 2		X	X	
Conioscinella No. 1		X	X	X
Hippelates pusio		X	X	
Lasiosina approximatonervis		X		
Lasiosina similis	X			
Meromyza communis			X	
Meromyza No. 1		X		X
Olcella parva		X		
Olcella provocans		X	X	X
Olcella punctifrons	X	X		
Olcella No. 1				X
Oscinella coxendrix			X	X
Oscinella frit	X		X	
Siphonella neglecta	X	X	X	X
Siphonella No. 1		X	X	X
Thaumatomyia glabra	X	X	X	X
Thaumatomyia rubida			X	

TRIXOSCELIDAE				
Trixoscelis sagulata		X		
Trixoscelis frontalis	X	X		
AGROMYZIDAE				
Agromyzidae No. 1			X	X
Agromyzidae No. 2	X			
Calycomyza No. 2	X			
Ceradontha dorsalis			X	
Liriomyza No. 2	X		X	
Liriomyza No. 3		X		
Liriomyza No. 5	X		X	
Liriomyza No. 6			X	
Liriomyza No. 7		X	X	X
Melanagromyza No. 1		X		
Ophiomyia No. 2	X			
Phytagromyza No. 4			X	
MILICHILDAE				
Desmometopa tarsalis			X	
Hemeromyia washingtoni		X		
Leptometropa halteralis		X	X	X
Madiza glabra			X	
Meoneura polita		X	X	
Meoneura nigrifrons		X		
OTITIDAE				
Euxesta No. 2		X	X	
Melieria canus		X		
Oedopa capito	X	X		
Otites pyrrocephala	X			
Otitidae No. 2	X			
SPHAEROCERIDAE				
Leptocera No. 1	X		X	
EPHYDRIDAE				
Allotrichoma No. 1	X		X	X
Allotrichoma No. 2			X	
Atissa pygmaea		X	X	X
Discocerina obscurella			X	
Ephydridae No. 1			X	
Hyadina pruinosa				X
Hydrellia No. 2			X	
Hydrochasma buccatum			X	
Mosillus tibialis			X	X
Phyliginia debilis	X	X	X	X
Psilopa compta	X		X	X
Scatella stagnalis			X	

LONCHAEIDAE				
Dasiops No. 1				X
LAUXANIIDAE				
Lauxanidae No. 2		X		
ANTHOMYZIDAE				
Anthomyza gracilis		X		
TETHINIDAE				
Pelomya coronata	X	X		
Tethinidae No. 1		X		X
SEPSIDAE				
Sepsis No. 1	X	X	X	X
Sepsis No. 2			X	
ACALYPTERATA No. 1		X		
CALYPTERATA				
TACHINIDAE				
Acemya No. 1		X		
Hyalomyia aldrichii		X	X	X
Leucostoma simplex			X	
Oxynops anthracinus		X		
Paradidyma singularis		X	X	X
Stomatomyia parvipalpus		X		
Tachinidae No. 1			X	X
Tachinidae No. 2			X	
Tachinidae No. 3	X			
CALLIPHORIDAE				
Calliphora coloradensis				X
Lucilia No. 1			X	
Phaenicia sericata				X
Phormia regina	X		X	
SARCOPHAGIDAE				
Amobia floridensis				X
Blaexosipha reversa		X		
Blaexosipha No. 1			X	
Blesophix inerminieri				X
Calythia micropteryx			X	
Metopia argyrocephala			X	
Miltogrammini No. 1				X
Phrosinella pilosifrons			X	
Ptychoneura aristalis				X
Ravinia No. 1			X	
Sarcophaga bullata				X
Senotainia flavicornis		X		

SARCOPHAGIDAE (Continued)				
Senotainia rubiventris		X		
Senotainia trilineata		X	X	
Taxigramma heteroneura			X	
ANTHOMYIDAE				
Anthomyidae No. 1				X
Anthomyidae No. 2	X			
Fannia No. 1			X	
Hylemya cinerella		X	X	
Hylemya neomexicana				X
Hylemya platura	X	X	X	X
Limosia No. 2				X
Pegomya No. 3			X	
Scatophaga stercoraria	X			
MUSCIDAE				
Coenosia No. 1			X	
Leucophora No. 1		X		
Muscidae No. 1			X	
HOMOPTERA				
CICADELLIDAE				
Aceratagallia cinerea	X	X	X	X
Aceratagallia uhleri				X
Aceratagallia No. 1	X	X	X	X
Aceratagallia No. 2				X
Aceratagallia No. 3			X	
Acinopterus viridis		X		
Acinopterus No. 1				X
Aligia oculea			X	
Aplanus albidus	X		X	X
Balclutha neglecta		X		
Ballana aris	X	X	X	X
Ballana No. 1			X	
Ceratagallia bigeloviae		X		
Chaitophorus No. 1			X	
Cicadellidae No. 1				X
Cicadellidae No. 3	X	X		
Cicadellidae No. 4		X		X
Circulifer tenellus	X	X	X	X
Coladonus belli	X			
Dikraneura carneola	X			
Empoasca alboneura	X	X	X	X
Empoasca exigua	X	X	X	X

HOMOPTERA (Continued)				
CICADELLIDAE (Continued)				
Empoasca maraspersa	X	X	X	X
Empoasca typhlocyboides	X	X	X	X
Empoasca No. 2				X
Empoasca No. 3				X
Erythroneura aspera	X		X	X
Exitanius exitiosus	X	X		X
Frigartus frigidus			X	
Hebecephalus No. 1	X	X		X
Idiocerus morosus	X			X
Idiocerus nervatus			X	X
Idiocerus rametosus				x
Idiocerus rotundens	X		X	
Idiocerus snowi			X	X
Laevicephalus exiguus			X	
Mesamia No. 1			X	
Mesamia No. 2			X	
Macropsis pallida		X		
Macrosteles fascifrons		X		
Opsius stactogalus	X	X	X	X
Pachyopsis lactus				X
Scaphytopius acutus			X	X
Scleriorneus plutonius				X
Stragania grandis	X	X		X
Xerophlœa peltata		X	X	X
MEMBRACIDAE				
Campylenchia latipes		X	X	
Leioscyta ferruginipennis		X	X	
Stictocephala bubalis			X	X
CERCOPIDAE				
Clastoptera delicata	X	X	X	X
Clastoptera brunnea		X		
ISSIDAE				
Hysteropterum cornutum	X	X	X	X
DELPHACIDAE				
Delphacidae No. 1		X		
Oliarus No. 2			X	
Pissonotus delicatus				X
Prokelisoidea salina		X	X	

DICTYOPHARIDAE				
Scolops pallida				X
Aridia compressa	X			
APHIDIDAE				
Aphis bonnevillensis	X			
Aphis minuta			X	
Aphis No. 1				X
Aphis No. 2				X
Braggia echinata				X
Covariella aegypodii	X		X	
Epamoebaphis No. 1			X	X
Macrosiphum escalanti			X	
Macrosiphum No. 1		X	X	X
Pleotrichophorus longinectarius		X	X	
Pleotrichophorus packi				X
Pleotrichophorus No. 1	X		X	
Pseudepamoebaphis No. 1	X			
Rhopalosiphum No. 1	X		X	
PSYLLIDAE				
Aphalara artemesiae		X	X	
Aphalara minutissima	X	X	X	
Aphalara No. 1	X			
Aphalara No. 2	X			
Aphalara No. 5	X			
Calophya triozomima	X	X	X	X
Psylla No. 1			X	
Psyllidae No. 3		X		
Psyllidae No. 5		X		
Trioza frontalis			X	
Trioza No. 1			X	
Trioza No. 2			X	
ORTHEZIIDAE				
Ortheziidae No. 1	X	X		
HEMIPTERA				
MIRIDAE				
Brachyopterus No. 1	X			
Chlamydatus associatus		X	X	X
Dereocoris triannulipes				X
Europiella No. 1	X	X		
Labopidea sericata	X			
Lopidea media		X		
Lygus hesperus	X	X	X	X
Miridae No. 1		X		
Miridae No. 2	X	X		

HEMIPTERA (Continued)				
MIRIDAE (Continued)				
Miridae No. 3				X
Miridae No. 4	X			X
Miridae No. 6		X		
Mirini No. 1		X		
Orthotylus altheae	X			
Orthotylus No. 1	X			
Orthotylus No. 2		X		
Parthenicus No. 1			X	X
Parthenicus No. 2		X		
Parthenicus No. 5		X		
Parthenicus No. 6	X		X	X
Parthenicus No. 7		X		
Parthenicus No. 8	X	X		
Phyllopidea picta	X			
Phytocoris No. 4				X
Pilophorus No. 1		X		
Plagiognathus No. 1			X	
Polymerus diffusus		X		X
Pseudatomoscelis modestus	X	X	X	X
Slaterocoris flavipes		X		
Trigonotylus tarsatus	X			
LYGAEIDAE				
Geocoris bullata		X		X
Kleidocerys resedae		X		
Lygaeus kalmii		X		X
Nyssius ericae	X	X	X	X
Sphragisticus nebulosus	X			X
RHOPALIDAE				
Harmostes reflexulus			X	
Liorhyssus hyalinus				X
Stictopleura viridicata		X		X
ANTHOCORIDAE				
Orius tristicolor	X	X	X	X
PENTATOMIDAE				
Thyanta punctiventris	X	X	X	
Chlorochroa sayi			X	
NABIDAE				
Nabis alternatus	X	X	X	X
PHYMATIDAE				
Phymata fasciata				X

LIST OF INSECTS FROM TABLES I - IV

HEMIPTERA (Continued)

REDUVIIDAE

Sinea diadema	X	X	X	
Sinea undulata			X	

COLEOPTERA

COCCINELLIDAE

Brumoides septentrionis				X
Hippodamia apicalis			X	
Hippodamia convergens		X	X	
Hyperaspis dissoluta		X		X
Hyperaspis lateralis				X
Psylloboro 20-maculata	X			
Scymnus nugator				X
Scymnus renoicus	X	X		X

CHRYSOMELIDAE

Crepidodera nana		X	X	X
Cryptocephalus confluentus	X			
Cryptocephalus No. 1	X			
Diachus auratus	X			
Longitarsus nitidicollis		X		
Monoxia angularis		X	X	X
Monoxia elegans	X	X	X	X
Monoxia puberula				X
Monoxia sordida				X
Pachybrachys microptus		X		
Pachybrachys signatus		X	X	
Pachybrachys No. 1		X		
Paria quadriguttata		X		X
Phyllotreta No. 1	X	X		X
Psyllioides No. 1				X
Systena gracilenta		X		

CURCULIONIDAE

Apion No. 1				X
Curculionidae No. 1				X
Curculionidae No. 5	X			
Curculionidae No. 6	X			
Epimechus No. 1	X	X	X	X
Epimechus No. 2				X
Tychius No. 1				X

CERAMBYCIDAE

Crossideus coralinus				X

BRUCHIDAE

Bruchidae No. 1	X			
Bruchidae No. 4	X	X		

BUPRESTIDAE

Agrilus malvastri			X	
Agrilus No. 1		X		

MELOIDAE

Gnathium No. 1			X	
Nemognatha immaculata				X

PHALACRIDAE

Phalacrus No. 1				X
Stilbus No. 1		X		

STAPHYLINIDAE

Scopaeus No. 1			X	
Staphylinidae No. 1				X

ANTHICIDAE

Ischyropalpus turgidicollis			X	X
Notoxus No. 1			X	

DERMESTIDAE

Anthrenus lepidus			X	
Cryptorhopalum uteanum		X	X	X

MELYRIDAE

Collops No. 1			X	
Tanaops No. 1			X	
Tanaops No. 2				X
Anthocomus No. 1		X	X	

MORDELLIDAE

Anaspidinae No. 1			X	X
Anaspidinae No. 3			X	

ASYTIDAE

Listus interruptus			X	X
Eudaster No. 1		X	X	
Ameocoris luteipes		X		

STYLOPIDAE

Stylopidae No. 1		X	X	X
Stylopidae No. 2		X	X	

THYSANOPTERA

THRIPIDAE

Frankliniella No. 1		X	X	X
Thripidae No. 2		X		

OELOLOTHRIPIDAE

Oelolothrips No. 1		X	X	X

LEPTOTHRIPIDAE

Leptothrips No. 1		X	X	X

THYSANOPTERA				
FAMILY?				
Thysanoptera No. 1		X		
Thysanoptera No. 2		X		
NEUROPTERA				
CHRYSOPIDAE				
Chrysopa No. 1		X	X	X
Chrysopa No. 2		X		
RAPHIDIIDAE				
Agulla No. 1	X			
LEPIDOPTERA				
SATYRIDAE				
Cercyonis sthenale		X		
TORTRICIDAE				
Tortricidae No. 1			X	
MICROLEPIDOPTERA				
Microlepidoptera No. 1	X			
Microlepidoptera No. 2	X	X		
ORTHOPTERA				
ACRIDIDAE				
Melanoplus differentialis	X			
Melanoplus mexicanus	X			
Acrididae (nymphs)			X	X
GRYLLIDAE				
Oecanthus nigricornis		X	X	
PLECOPTERA				
PERLIDAE				
Perlidae No. 1		X		
TRICHOPTERA				
LEPTOCERIDAE				
Leptoceridae No. 1		X		X
COLLEMBOLA				
SMINTHURIDAE				
Smithuridae No. 1	X		X	

Total 22 Species

Microbiology:

Materials and Methods

MATERIALS AND METHODS

Sampling Station and Samples

Four sampling stations were established near soil survey pits No. 39, 50, 55, and 58, and located with marked stakes. Site (Station) 39 is located near soil survey pit #39, 1.5 m east of the old road. *Bromus tectorum*, *Tetradymia spinosa*, *Stipa comata* and *Artemesia tridentata* constitute the most prevalent species encountered at site 39 with *Grayia spinosa*, *Chrysothamus nauseous*, *Sarcobatus vemiculatus* and *Artemesia nova* as some other contributors to plant litter inputs at this sampling station.

Site 50J is located some distance from soil survey pit #50 in a juniper area. The vegetation at this site is dominated by *Juniperus osteosperma*, and litter samples are collected exclusively under its canopy. *Sarcobatus vermiculatus*, *Chrysothamus nauseousus*, *Stipa comata*, *Hilaria jamesii* and *Artemesia tridentata* comprise the other major vegetation types at this location.

Site 55R is located five meters off the White River bank and is dominated by a mixed riparian vegetation of which *Bromus tectorum* (downy brome) and *Agropyron smithii* (western wheatgrass) are most prevalent. Other contributors to the high ground cover observed at this site include annual mustards and yellow blossom sweet clover, *(Melilotus officinalis)* as well as *Atriplex canescens*, *Populus fremontii*, *Sarcobatus vermiculatus*, *Kochia* spp., and *Distichlis spicata*.

Site 58 is located near the rim of Southam Canyon and is inhabited mainly by *Bromus tectorum*, *Chrysothamus viscidiflorus*, *Artemesia tridentata*, *Chrysothamus greenei* and *Chorispora tenella*. *Atriplex confertifolia*, *Sarcobatus vermiculatus*, *Tetradymia spinosa* and *Opuntia* spp. are other prevalent species at site 58.

Figure A shows the relative positions of the sampling stations in the study area and their respective elevations.

Sample Designations

Samples taken at various depths of each site are designated as follows:

39-1	Surface-3cm.	55R-1	Surface-3cm
39-2	5-20cm	55R-2	5-20cm
39-3	40-50cm	55R-3	40-50cm

50JC-1	2-4cm. beneath canopy of *J. osteosperma*
50JC-2	4-15cm. beneath canopy of *J. osteosperma*
50JL	Surface, litter beneath canopy of *J. osteosperma*
50JI-1	Surface-3cm, Interspace
50JI-2	5-20, Interspace
58C-1	Surface-3cm, beneath canopy of *Artemesia tridentata*
58C-2	5-20cm, beneath canopy of *Artemesia tridentata*
58C-3	40-50cm, beneath canopy of *Artemesia tridentata*
58I-1	Surface-3cm, Interspace
58I-2	5-20cm, Interspace
58I-3	40-50cm, Interspace

Sample Treatment and Storage

Upon receipt in the laboratory samples are ground and/or particles larger than 3mm in diameter are removed. The sample is then placed in air tight plastic bags and stored at 4°C until examined.

Determination of Microbial Numbers

One gram of each sample was placed in a 250 ml screw-cap Erlenmeyer flask containing 99 ml sterile distilled water to give a 1:100 dilution. After shaking, further dilution of 10^{-3}, 10^{-4}, 10^{-5} and 10^{-6} were made in sterile water. Five plates were made for each dilution. Plates with 10^{-2}, 10^{-3}, and 10^{-4} dilutions were poured with Martin's Medium for the enumeration of fungi. Plates weith 10^{-4}, 10^{-5} and 10^{-6} dilutions were poured with soil extract agar for the enumeration of bacteria and streptomycetes. The plates were incubated at 22°C.

The fungal plates were counted after 5 days, the bacterial colonies in the soil extract agar plates were counted after 5 days and the streptomycetes on the same plates between 7 and 14 days.

For microaerophilic plate counts, soil dilutions of 10^{-3} and 10^{-4} were plated with Brewer's Anaerobic Agar (Difco). The solidified plates were placed in desiccator jars of BBL anaerobic system. The desiccators contained a small amount of CO_2 and H_2. After 7 days the plates were removed from the desiccators and counted.

All microbial counts are reported on an oven-dry soil weight basis.

Media: For streptomycetes and total aerobic bacteria soil extract agar with glucose was used (based on Fred and Waksman, 1928).

Martin's Medium was used for funci (Allen, 1957).

Soil Respiration. (Elkan and Moore, 1962)

Ten grams of soil sample were placed in a 125 ml screw-capped Erlenmeyer flask with center well. One ml of 0.04 N $Ba(OH)_2$ solution was added to the center well. The blank contained no soil but one ml of distilled water. The flasks were tightly capped and incubated in a 30°C (86°F) water bath shaker for 90 minutes. Titration was carried out with 0.02 N HCL until a clear solution was obtained.

Before each incubation, the negative water potentials of each soil sample were measured as described below. The water potentials were again measured at the end of the incubation time for each soil sample. The average negative bar reading between the beginning and ending was the approximate negative bar pressure of the sample during the reaction time.

Dehydrogenase Activity was determined as described by Casida, Klein and Santoro (1964).

Each soil sample was weighed into three sterile screw-cap tubes, 6 g per tube. To two of the tubes were added 2.5 ml sterile distilled water and 1.0 ml of a 3% aqueous solution of 2, 3, 5-triphenyltetrazolium chloride. To the third tube (control) 3.5 sterile distilled water was added. The tubes were mixed thoroughly with a Vortex mixer and then incubated in a 30°C incubator for 24 hours.

Extraction of the triphenyltetrazolium formazan produced was carried out with methanol.

The absorbance was read at 485nm. The results are reported as mg formazan in 100 ml of filtrate.

Proteolytic Activity. (Hoffmann and Teicher, 1957)

For the assay 10 g of soil sample were placed in each of two 100 ml screw-cap volumetric flasks. Five-hundred mg of calcium carbonate was added to each flask and mixed in; 1.5 ml of toluene was added drop by drop so that most of the soil was dampened. After standing for 15 minutes, 20 ml of a freshly made 2% gelatin solution was added to one flask, and 20 ml of distilled water to the other flask. After thorough mixing, the flasks were placed on a rotating apparatus in a 37° C (98.6°F) incubator.

After 20 hours incubation the contents of each flask were gravity filtered.

To assay for the amount of hydrolyzed gelatin with 5 ml of filtrate, 5 ml of a cupric phosphate reagent suspension was added. The mixture of filtrate and cupric phosphate suspension was incubated for 5 minutes, centrifuged, and the absorbance of supernatant read at 660 nm.

The standard solution for this assay was a 2% solution containing the appropriate amino acids by weight that make up gelatin.

ATP Concentration

There exists a linear relationship between the amount of ATP added to the firefly (*Photinus pyralis*) luciferin-luciferase system and the duration of light out-put.

To prepare the luciferin-luciferase susnension, a vial of firefly lantern extract (Sigma FLE-50 or 250) was rehydrated with deionized-distilled water. The vial was left to stand at room temperature for two hours and then stored at 4° C (39.2°F). Before use, the susnension was centrifuged at 10,000

g for 10 minutes to remove insoluble debris.

A standard stock solution was prepared initially by dissolving 10 mg of crystalline disodium ATP in 1000 ml Tris buffer (0.25 M). The solution was capped and stored at -4° C (24.8°F) and working standards were prepared by thawing and diluting stock solution with Tris buffer to the desired concentration. A standard curve of concentration vs. midrange of count sequence was plotted on log paper and unknowns determined by ~~such a curve.~~ comparison with the standard curve.

A liquid scintillation spectrometer, Packard Tri-carb Model 527, was used to determine light intensity.

Two grams of soil were placed in a 250 ml boiling flask and 25 ml of 1:1 boiling solution of Tris buffer and 95% ethanol were added. The flask was placed on a high vacuum rotating evaporator partially submerged in a 55° C (131°F) water bath. After 5 minutes, the contents of the flask were brought ~~up~~ to a 25 ml volume with ice-cold Tris buffer. Then the soil extract was centrifuged for 10 minutes at 10,000 g to remove the soil particles.

For the light intensity, 1.8 ml of standard or soil extract ATP solution were pipeted into a glass liquid scintillation counting vial. At zero time, 0.2 ml of reconstituted enzyme extract were added and the vial was placed in the liquid scintillation counter. The first count was begun 15 seconds after the enzyme addition and continued for 6 seconds.

The analysis was conducted in semi-darkness to avoid chemoillumine-scence and the scintillation vials were stored in the dark when not in use.

After sequential scintillation counts ~~are~~ were obtained, the data was put into a PDP computer system programmed with the Simpson Integration Program and an integral was obtained. This was referenced to integrals of standards and a value of ATP concentration ~~is~~ was obtained.

Nitrification Potential

Forty g of soil was weighed into each of three glass 400 ml beakers and treated as follows:

The ingredients were thoroughly mixed and the water content was brought to -0.3 bar. The beakers were covered with paper and maintained at constant moisture for 21 days at 28° C. (82.4°F) At the end of the incubation period, quantitative determination of each soil was made for exchangeable NH_4^+-N, and NO_2^- + NO_3^--N. The NO_2^- + NO_3^--N in the treated soils minus the control gives values for nitrification potential.

Total Nitrogen Content

Content was determined by the Kieldahl Method, including modification made by Utah State University Soil Science Laboratory (1961) and Bremner (1965).

Nitrate - Nitrogen

Content was determined by Utah State University Soil Service Laboratory using phenol disulphonic acid method.

Total Ammonium Nitrogen. Fixed NH_4^+-N and Exchangeable NH_4^+-N)

Four grams of soil was placed in a semi-micro Kieldahl flask and steam distilled with 20 ml of 40% NaOH. The ammonium-nitrogen was collected in 5 ml of 2% H_2BO_3 containing three drops of Tashiro's indicator. This was titrated to the endpoint with the primary standard 0.01 N $KH(IO_3)_2$. The ml of titrant multipled by the normality gives the milliequivalents (meq) of N in the sample. The meq weight of N is 14 mg/meq and when multiplied by the meq gives the mg of N in the sample.

Nitrogen (N_2) Fixation Potential

The N_2 fixation potential was determined by the acetylene reduction assay modified from Stewart, Fitzgerald and Burns (1967). Soil Samples were prepared by adding two grams of surface soil (0-3 cm) to 13 x 60 mm

glass tubes sealed at the bottom with a rubber stopper. Each sample was moistened with 1.0 ml of distilled water, and capped with injectable serum stoppers; 0.6 ml acetylene (Matheson Co.) was injected into each sample tube resulting in a concentration of 0.1 atmosphere.

Each soil core was then placed 15 cm from an incandescent light source for 24 hours at 23° C (73.4°F).

For the determination of ethylene, a 0.2 ml gas sample was withdrawn and injected into a Varian gas chromatograph. Helium was used as a carrier gas with a flow rate of approximately 25 ml per minute with a 2.74 m Porapak R column, 100 to 120 mesh, at 50° C (122°F). The injection temperature was set at 55° C (131°F), and the hydrogen flame detector at 90° C (194°F).

A strip chart recorder was used for reading of the ethylene peaks. The concentration of ethylene was then determined from a standard curve using pure ethylene. The crust surface area of the soil tubes was 1.324×10^{-8} hectares and 1.0 nanomole C_2H_4 produced equals 9.33×10^{-9} grams of nitrogen fixed. Nanomole's $C_2H_4 \times 0.7046$ equals grams nitrogen (N_2) fixed per hectare.

Soil Moisture Content

Ten grams of each soil sample in weighing bottles were placed in a drying oven at 110° C (230°F). After 3 days the samples were reweighed. The amount of weight loss was calculated as the number of grams of water per 100 g of soil.

$$\frac{\text{Moist Weight - Dry Weight}}{\text{Dry Weight}} \times 100 = \% \text{ Moisture}$$

Soil pH

Soil pH was determined in 1:1 water suspension.

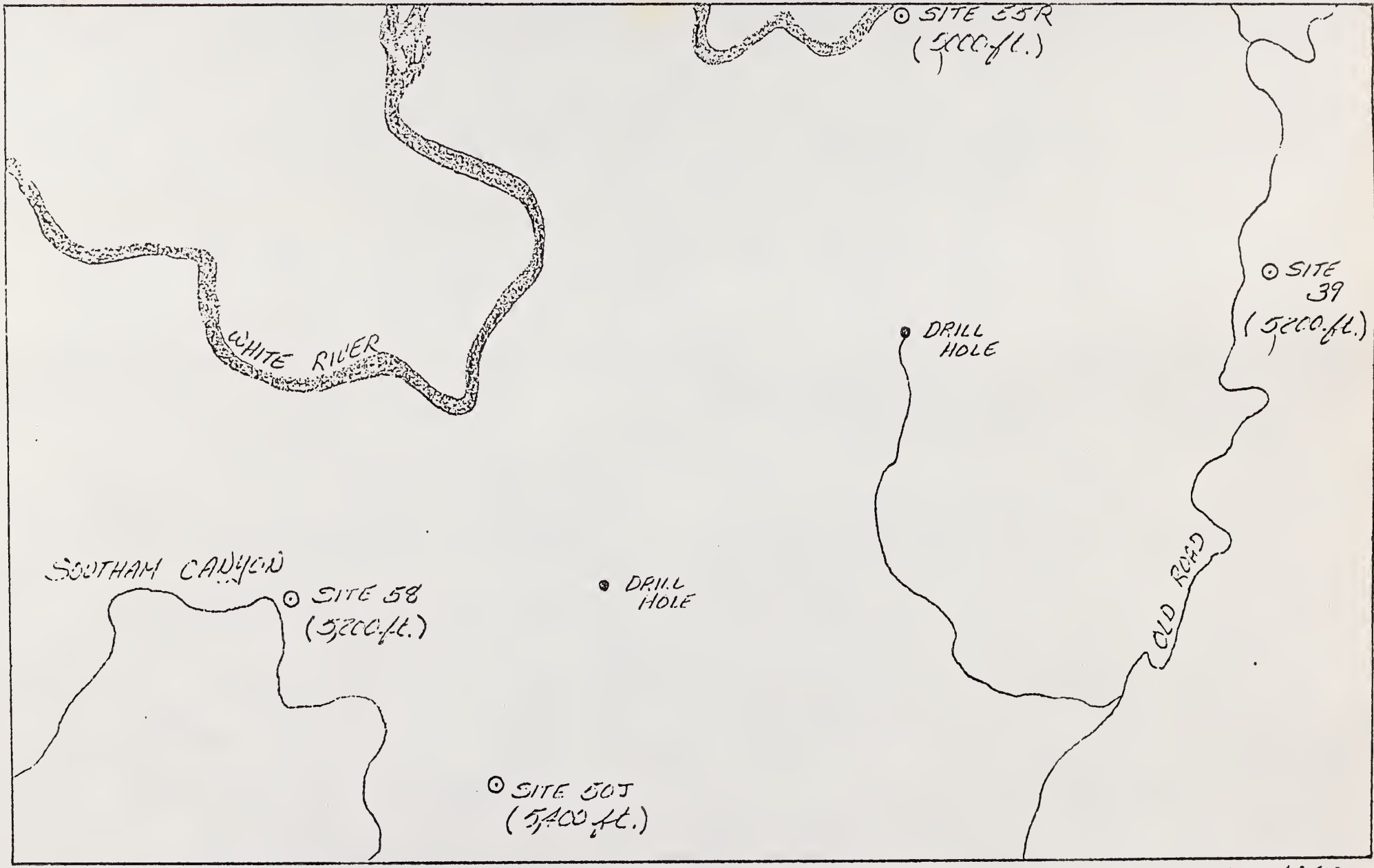
Water Potential Measurement

Soil water potential was measured using a Wescor, Inc., Model MJ55 psychrometric microvoltmeter with a Model C-51 sample chamber psychrometer

(Brown and Van Haveren, 1972; Wiebe, et al., 1971; Robinson and Stokes, 1949; Lang, 1967; Campbell and Gardner, 1971).

A NaCl standard calibration curve for a "wet" soil having water potentials between 0 and -100 bars was made. Standard solutions were made up at room temperature, 22° C (71.6°F) to 23° C (73.4°F). The temperature of the chamber was first read, and then the temperature of the solution. Equilibration time between chamber and solution was 1.5 minutes. The readings were essentially linear.

A LiCl standard calibration curve was made to be used for measuring low water potentials to -800 bars. The lithium chloride concentrations for solutions having water potentials ranging from -100 to -1000 bars calculated for 22° C had an equilibration time between chamber and solution of 1 1/2 minutes. The readings were linear.



SCALE 1:24000

*BASED ON: TOPOGRAPHICAL MAP OF SOUTHAM CANYON, UTAH PREPARED BY U.S. DEPT. OF THE INTERIOR GEOLOGICAL SURVEY 39°52.5'-109°07.5'/7.5

FIGURE - A MICROBIOLOGY SAMPLING STATION LOCATIONS*